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CONCERNING NEWER METHODS OF URETHRO-VESICAL DIAGNOSIS AS APPLIED TO THE NECK OF THE BLADDER AND POSTERIOR URETHRA.*

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To the cystoscopist the internal vesical sphincter, the juxta sphincteric region, and the posterior urethra present greater difficulties in diagnosis than any other portion, of either the urethra or bladder. Not only is it extremely difficult to properly visualize the region of the internal vesical sphincter because of its peculiar anatomic construction, and because of the close proximity of the sphincter muscle and optical instrument, but it is almost impossible to correctly estimate the character and extent of the lesions that occur outside of the pale of the mucous membrane, namely, within the territory of the prostatic tissue, and within the sphincter muscle itself.

My paper will include a résumé of what I consider the best methods of visualizing the region of the vesical neck and posterior urethra, with a brief summary of the field of application of the various types of instruments, and will also offer a description of a new cysto-urethroscope that I have been using for somewhat more than a year, and that has been found extremely useful both in diagnosis and therapy.

Two factors, it must be remembered, come into play at the internal vesical sphincter, and are responsible for many of the difficulties of diagnosis in this region—namely, the lack of dilatability of the bladder neck and its muscular activity.

Lesions at the internal sphincter may produce distortions in various planes, and the choice of the method of examination to be employed, depends, in a sense, upon the plane in which such alterations take place. Thus, it is impossible for any single one of the various instruments or optical systems to give full information regarding every lesion, either at the neck of the bladder or in the posterior urethra. Theoretically, we should have recourse at least to three different types of optical systems in order to obtain a view in all the possible planes, in which lesions may dispose themselves. I say this, however, with a reservation, namely, that we are unfortunately limited, in visual diagnosis, to distortions and intrusions that occur within the urethro-vesical lumen, knowing very little of what occurs in the eccentric, intramural, extra-urethral or extra-vesical directions.

Fig. 1—will clarify what I mean, and will also show what we may expect to see with the three types of instruments.

In the posterior urethra, the planes in which lesions may be viewed are tangential to the elements of a theoretical cylinder lying in the urethral canal (Fig. 2). Vertical, sagittal, or transverse planes perpendicular to these will contain the various elevations or intrusions of the urethral membrane.

It is the indirect or prismatic type of cysto-urethroscope that will enlighten us best as to lesions in these planes (Fig. 2); and, when the urethra is dilated, will give excellent views, not only of the horizontal planes that lie lengthwise in the urethra, but also of those sagittal vertical planes that are perpendicular to the former.

At the neck of the bladder, however, by reason of the muscular closure, and the close contact of the sphincter and the instrument, elevations or intrusions in planes perpendicular to the shaft of the instrument are barely discernible, except under special circumstances. Here, therefore, the scope of the prismatic or indirect cysto-urethroscope is limited to distortions in a sagittal direction parallel with the shaft of the instrument. That is, at the sphincteric margin the cysto-urethroscope of the indirect type affords pictures of linear alterations lying in planes that represent a theoretical continuation into the bladder of the walls of the urethra. Thus, at the margin of the sphincter a sub-cervical elevation may be difficult to estimate, whereas, a similar submucous growth that produces an intravesical intrusion, in a sagittal sense, would be beautifully shown (Fig. 2.) It is clearly evident that other instruments are required for changes that occur in the vertical planes.

Such vertical planes may be viewed, either from in front (from the urethral side) (Fig. 3), or from behind (from the bladder side) (Fig. 4).

* Read before the Section on Genito-Urinary Surgery of the New York Academy of Medicine—Nov. 22nd, 1917.

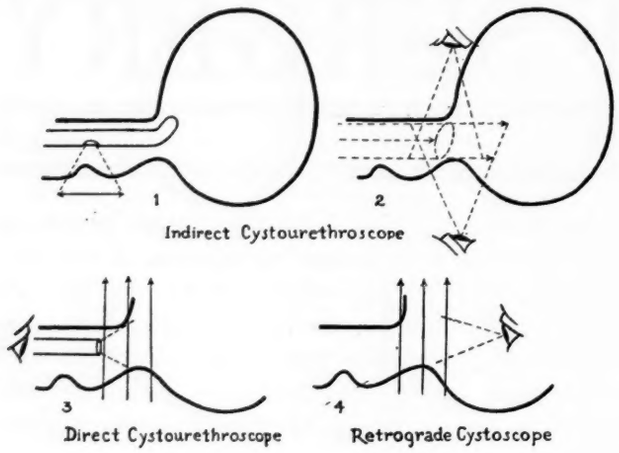

Fig. 1—Diagram showing the indirect cysto-urethroscope* inspecting the flow of the posterior urethra, the arrow lying in the plane in which obects are seen.

Fig. 2—A theoretical cylinder lies in the posterior urethra, and intrusions at the sphincteric margin are best seen when they lie in the plane of the arrow, that is, in a sagittal direction.

Fig. 3—Posterior urethra and neck of the bladder viewed from the urethral side by means of the direct cysto-urethroscope.

Fig. 4—The neck of the bladder viewed from the vesical side, as with the retrograde cystoscope.

* Indirect cysto-urethroscope and author's universal cysto-urethroscope are synonymous.

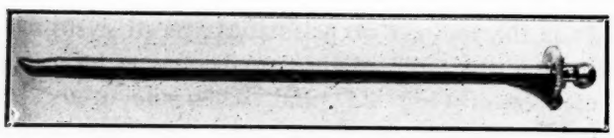

Fig. 5—Sheath or endoscopic tube of the author's Universal Cysto-urethroscope, with obturator in situ.

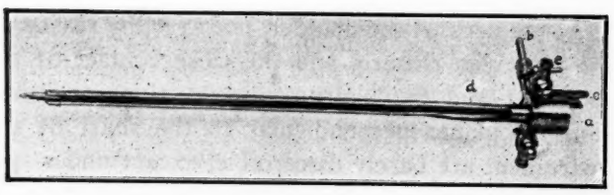

Fig. 6—Light carrier of the direct telescopic cysto-urethroscope, or universal urethroscope; a, cuff; b, contact for electric light connection; c, looking fork; d, irrigating tubule; e, faucet for entry of irrigating fluid.

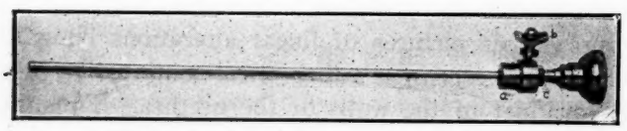

Fig. 7—Telescope of the universal urethroscope; a, conical fitting; b, locking screw; c, washer or gasket, which tightens the telescope.

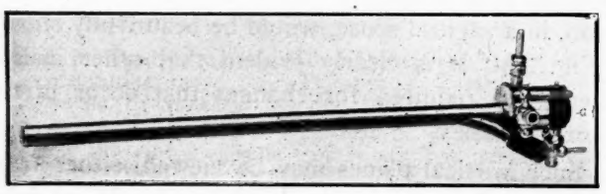

Fig. 8—Sheath or endoscopic tube with light carrier and magnifying window in place. This is an assemblage for air inflation, ordinary single endoscopy or Elsner-Braasch cystoscopy.

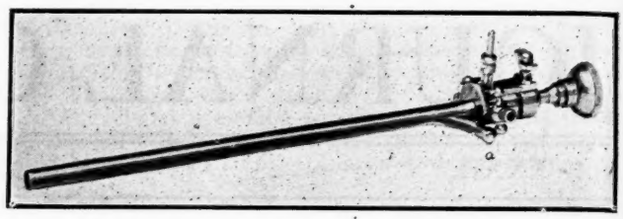

Fig. 9—Complete assemblage: sheath, light carrier and telescope a, large catheter outlet to which suitable rubber cap or tip must be attached.

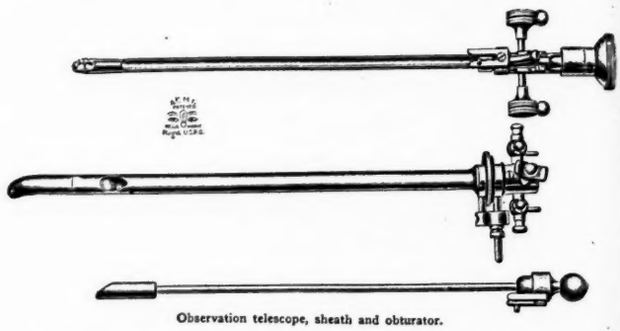

Fig. 10—Observation cysto-urethroscope.

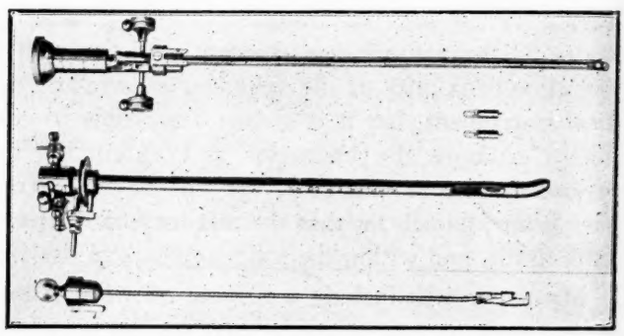

Fig.11—Operating cysto-urethroscope.

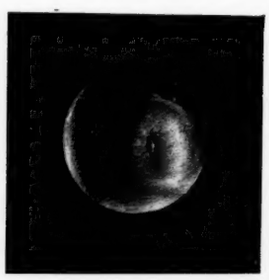

Fig. 12—Swollen verumontanum as seen with the indirect cysto-urethroscope, showing inflammatory excrescences.

Fig. 13—Edematous and cystic lesions behind the verumontanum, as seen with the indirect cysto-urethroscope.

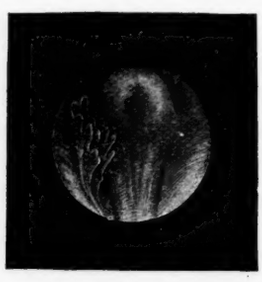

Fig. 14—Normal verumontanum with a small papilloma arising from near its base, as seen with the indirect cysto-urethroscope.

Fig. 15—Distorted verumontanum with large sicatrix in one of the sulci laterales representing old inflammatory focus in the prostate.

Theoretically, a simple endoscopic tube with direct illumination by means of a Valentine lamp, should suffice for such an examination from the urethral side. But experience has taught us that the telescopic instruments with water dilatation are far superior. For the purpose, therefore, of examining the posterior urethra and neck of the bladder, in what I may term the anterior or distal vertical plane (i. e., in vertical plane viewed from the urethral side), I have been employing an instrument which in certain respects is similar to the Geiringer instrument, but which possesses so many new features in its optical and mechanical construction, and so many new fields of therapeutic application, that I may be permitted to describe it in detail.

Fig. 3 illustrates diagrammatically how such an irrigation instrument brings into view the neck of the bladder and posterior urethra in the anterior or distal vertical plane, although the collapsibility of the urethra, and the dilating effects of the inflowing fluid are not depicted.

Finally, there remains the third method of viewing the neck of the bladder, but in the posterior or distal side or aspect of the vertical plane, namely, by means of the well-known retrograde cystoscopic method (Fig. 4). This method has been but little employed, partly because the optical and mechanical problems entailed have not yet been completely solved, and partly because the views obtained with it are modified by the fact that the sheath of the instrument must lie within the sphincter. The sphincter, in functional activity, therefore, cannot be properly viewed, because it is occupied, and, therefore, is functionally disturbed by the presence of a rigid metallic bar, namely, the sheath of the instrument.

It is but the first two methods, the indirect, telescopic or prismatic cysto-urethroscope, and the direct, non-prismatic telescopic urethroscope or cysto-urethroscope, that I shall discuss, leaving my work with the third method to be published at some future time. Since the features of the cysto-urethroscope are well known, I shall but briefly refer to my two models, namely, the observation cysto-urethroscope, and the operating cysto-urethroscope, shall describe in greater detail the instrument which may be called a "Universal Cysto-Urethroscope," and finally shall discuss the application of these instruments, particularly in the territory of the posterior urethra and neck of the bladder.

The Universal Cysto-Urethroscope. Although a large number of urethroscopes have been devised, for each of which claims of superiority over all others are put forth by their various inventors, it has seemed to me, in the courses of studies on diseases of the urethra, that one fruitful field for the exercise of therapeutic endeavors through a modern urethroscope had been overlooked, namely, the treatment of filiform strictures of the urethra. It was for the purpose of visualizing the orifice of filiform strictures and for the introducing of filiform bougies under the control of the eye, that a new and useful urethroscope was devised. This was finally developed into a sort of universal cysto-urethroscope, an instrument with a wide field of utility, embodying in its construction features of the simple endoscope, the Goldschmidt, Brown and Geiringer instruments, modified in such a way as to give it a wide sphere of utility.

Description of the Instrument. The urethroscope consists of a straight endoscopic tube (Fig. 5), two obturators, a light carrier (Fig. 6), a telescope (Fig. 7) and a magnifying window (Fig. 8a).

The straight tube is longer than that of the ordinary urethroscope (7 1/4 inches) so as to be available for work in the bladder as well as in the urethra. Near the ocular end (Fig. 5), a large catheter outlet, of the type used in the author's operating cystoscope, is fused into the tube. Through this, special operating devices, such as rongeur forceps, fulguration electrode, filiform and larger bougies, catheters and applicators may be passed. Since the direction of this outlet, and therefore, the exit of entering devices is downward, the operator can manipulate more satisfactorily through it than through a straight endoscopic tube, vision being undisturbed by an intervening hand or instrument.

The endoscopic tube is reinforced at the ocular end by a flange, and admits the light carrier with a water-tight joint.

Two faucets also fit into the cuff. These give entry and exit to fluid for the distention of the urethra, making for an improvement in the clarity of the visual field, and for better manipulation of the instrument.

The obturators are designed either for work in the anterior urethra or in the posterior urethra and bladder. An obturator with a short, blunt conical extremity serves for work in the anterior urethra. The short obturator must be chosen for the cases in which we desire to treat filiform strictures of the urethra, lesions in the anterior urethra, or when we wish to remove foreign bodies from the anterior or bulbo-membranous urethra. The curved beaked obturator is to be selected whenever the instrument is to be inserted into the bladder.

The light carrier differs materially in its construc-

tion from any other previously designed, in that it is composed of a sector of a thin tube that fits tightly against the inner wall of the endoscopic sheath, and bears the irrigating tubule. It is equipped with a delicate lamp, which extends be-

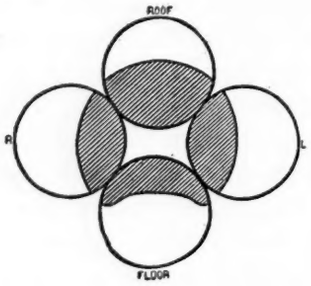

Fig. 16—Diagrammatic representation of the neck of the bladder as seen with the indirect cysto-urethroscope. At the roof and sides a concave line is seen, a slightly convex line at the floor of the sphincter.

yond the carrier, being of such length that its rays can emerge and illuminate the usual endoscopic field. This type of light carrier possesses advan-

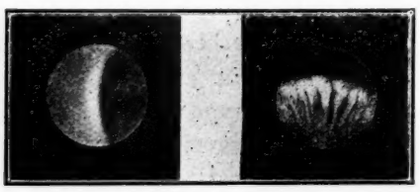

Fig. 17—the concave appearance of the side walls of the sphincter.

Fig. 18—Shows the slight convexity usually seen at the floor of the sphincter as viewed with the indirect type of cysto-urethroscope.

tages over the usual forms, particularly in that its rigidity tends to maintain it in close apposition with the sheath.

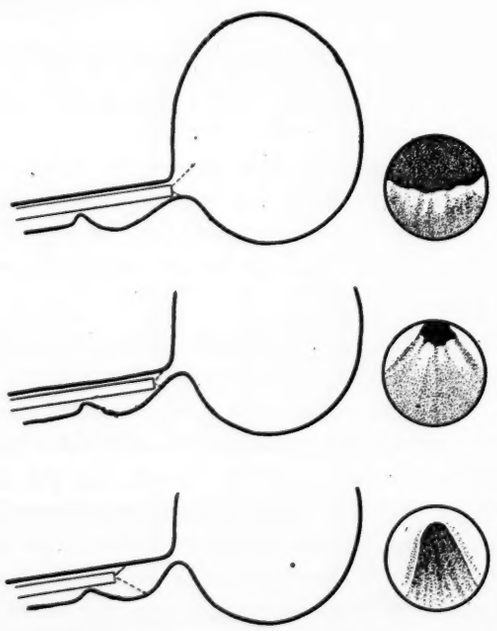

Fig. 19—a—shows the view as seen with the direct type of cysto-urethroscope at the sphincter;
b—with the urethroscope drawn out into the supramontane urethra;
3—still farther in the region behind the verumontanum.

At the proximal end of the light carrier is the cuff (Fig. 6a) for the attachment of the electric contact (Fig. 6b) and its joint for the introduction of either the telescope (Fig. 7) or the magnifying window (Fig. 8a).

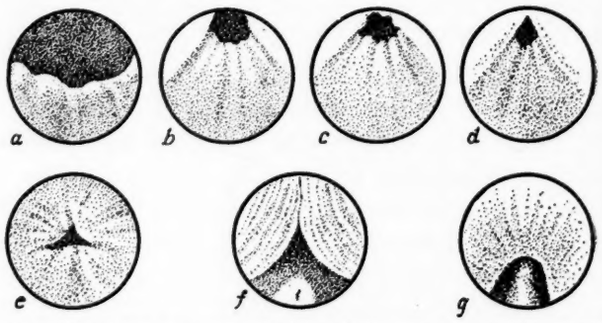

Fig. 20—Views of the vesical sphincter, and posterior urethra with the direct cysto-urethroscope.
a—concavity at the sphincteric margin.
b, c, d—show how little of the superior margin of the sphincter comes into view.
f, g—show the verumontanum; at f, the summit; at g, the acclive.

Occupying one of the furrows at the side of the lamp tube is a fine tube, or tubule (Fig. 6d) that has its inlet at the faucet (Fig. 6e) and allows the irrigating fluid to escape at the objective end of the

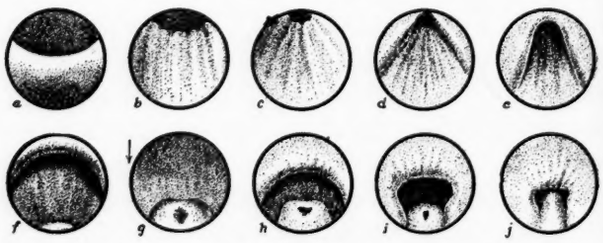

Fig. 21—Views of the sphincteric margin and posterior urethra with the direct cysto-urethroscope.

apparatus. Only in this way is it possible to obtain adequate cleansing of the urethral field when the instrument lies beyond the internal sphincter. When

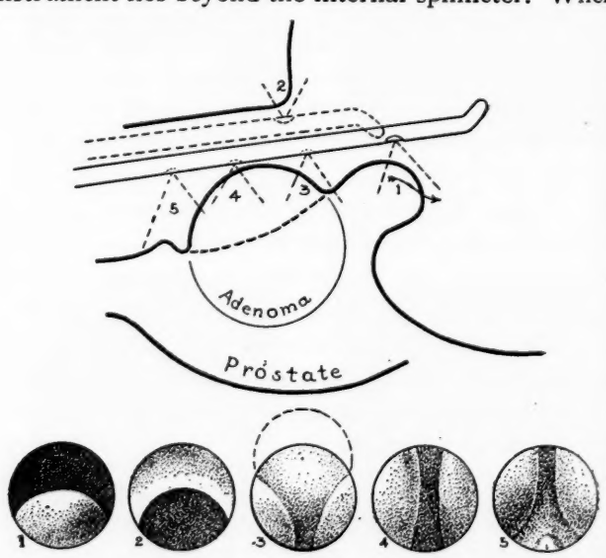

Fig. 22—Diagrammatic view of the indirect cysto-urethroscope riding on the middle and lateral lobe in cases of prostatic adenoma. The pictures at the situations seen in the upper figure being represented in circles below.

the urethroscope enters the bladder, irrigation may be effected without recourse to this irrigating tubule. The normal flow of fluid with the instrument in the urethra, then, is a current that begins at the far, or objective, end of the instrument and flows back and out through the second faucet at the ocular or proximal end.

The telescope. This is of the direct, non-prismatic, forward vision type, and its lens system is so designed that a sufficiently wide visual angle offers a view of operating instruments soon after they emerge from the sheath. It is held in a truncated conical fitting that locks into the cuff receptacle of the light carrier tube. However, it is not rigidly held. except when the washer screw is tightly secured (Fig. 7c), a forward and backward movement being permitted when the screw is loosened. This retrograde movement of the telescope is provided for the contingency which arises when operative devices are thrust through the sheath and a better view of their working end is desired. It will be found that a considerable portion of an operative instrument must needs be exposed beyond the sheath for a good view. If we pull back the telescope, however, we may work the jaws of the operating device at a short distance from the tube, sacrificing merely a small portion of the field thereby, but in no way impairing the utility of the visual instrument.

The Magnifying Window. In order to convert the telescopic instrument into an air-inflating instrument, or an Elsner-Braasch cystoscope (Fig. 8), or into an ordinary straight tube urethroscope, a magnifying window is provided, which serves, not only to close the tube for air inflation or water distention, but also magnifies the direct picture slightly, and obviates the necessity for accommodation of the eye at so close a distance. Thus, if we withdraw the telescope and attach the magnifying window, we may see the ureters according to the Elsner method, and examine the urethra by the same method, or, we may mop out the sheath, aspirate the contents of the urethra through the tubule (Fig. 6d) and inspect or treat according to either the air inflation or simple open air method.

In short, the instrument is *universal* in that it combines the uses of the following:

(1) An open air anterior urethroscope and posterior urethroscope.

(2) An air inflation anterior and posterior urethroscope.

(3) A direct telescopic cystoscope (to replace the Brown).

(4) A direct telescopic operating cystoscope.

(5) An operating, irrigating anterior and posterior non-prismatic telescopic urethroscope.

(6) An Elsner-Braasch urethroscope and cystoscope.

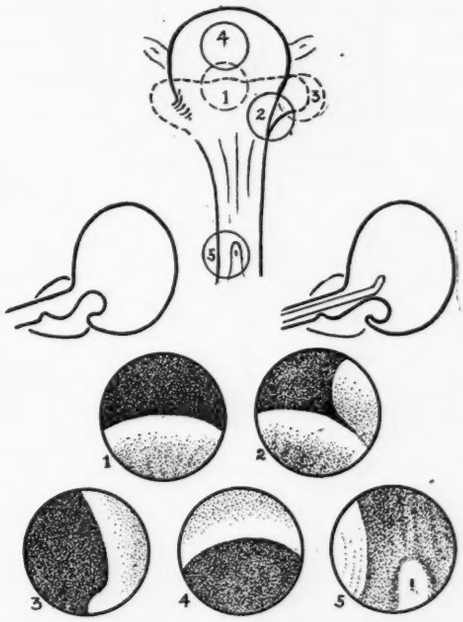

Fig. 23—The indirect cysto-urethroscope in some cases of middle lobe adenoma, the circles represented below corresponding to the situation of the instrument in the upper diagram.

(7) A Kelly or Luy's endoscope and cystoscope.

Technic with the Irrigating Instrument. This universal cysto-urethroscope is chiefly recommended as an irrigating telescopic instrument for the neck of the bladder, posterior and anterior urethra. The technic of its use is as follows:

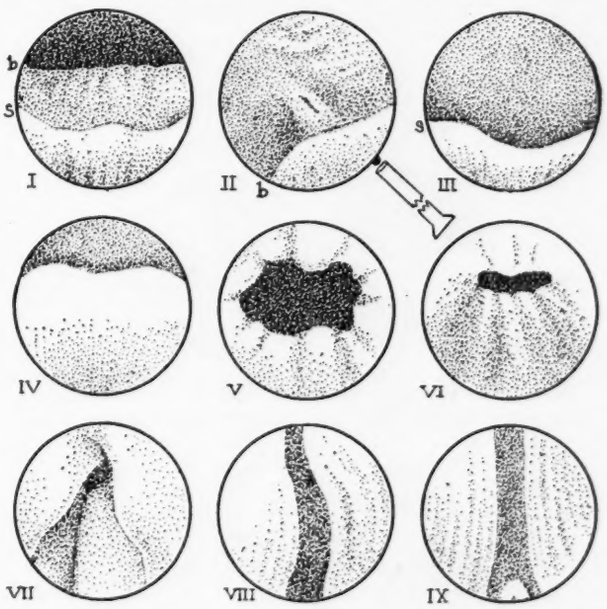

Fig. 24—Pictures with the direct cysto-urethroscope in the case of contracture of the neck and median bar formation.
I-bs, the bar;
II-b, bar hiding trigone;
s, sphincter;
VIII-IX, fibrotic lateral walls.

The sheath fitted with the curved obturator is in-

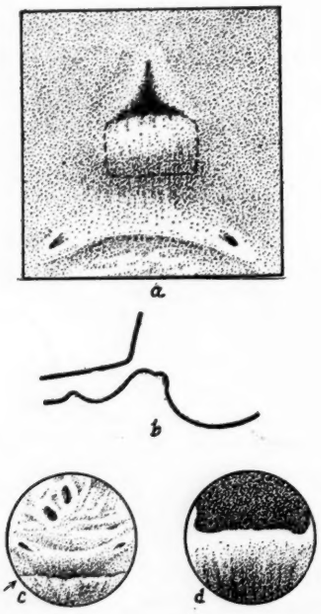

Fig. 25—Another case of contracture of the neck of the bladder with a median bar.
a—illustrating the region excised at operation.
b—a sagittal section of the bladder at the neck.
c—the shortened trigone and prominent bar.
d—the margin of the sphincter with the direct cysto-urethroscope.

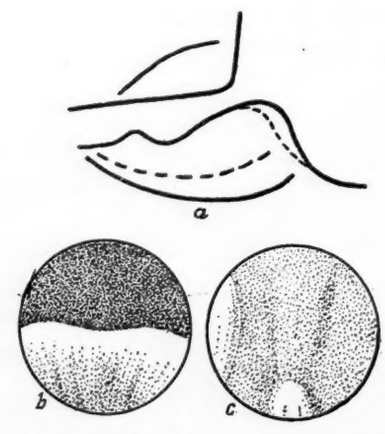

Fig. 26—a—sagittal section of a case of diffuse prostatic fibrosis, showing the general enlargement of the sphincteric region.
b, c—show the absence of suggestive findings in the urethra.

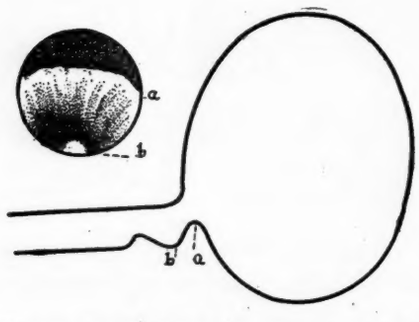

Fig. 27—Diagram representing a short supramontane urethra with a rather precipitous drop (a-b), shown in the circle with the indirect cysto-urethroscope.

troduced into the bladder (Fig. 5), the obturator removed, and the bladder irrigated if necessary. The light carrier (Fig. 6) and telescope (Fig. 7) are now locked in place (Fig. 9), and the irrigating fluid allowed to flow through one of the faucets

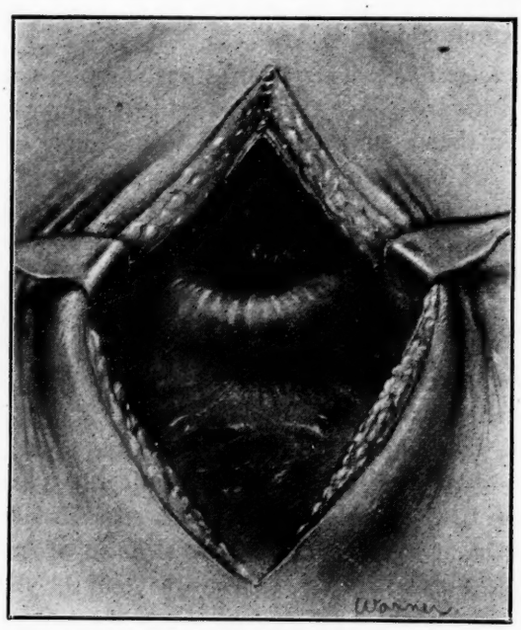

Fig. 28—Bar encountered in a case of contracture of the neck of the bladder, the opening of the sphincter being practically closed by it.

(Fig. 6e), a rubber tip or cap having been adjusted at (Fig. 8) the catheter outlet. The trigone, ureters, bas-fond, and the posterior wall of the bladder

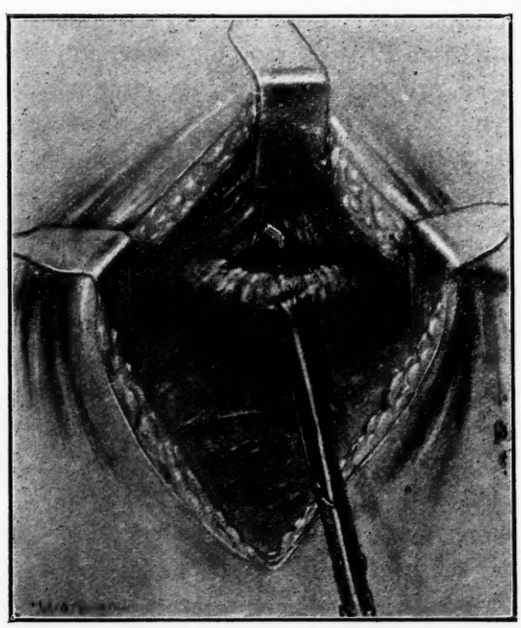

Fig. 29—The bar is pulled away by means of a fixation forceps, showing the orifice of the internal sphincter.

may be adequately illuminated and brought into view, and we may then proceed with the examination of the neck of the bladder and urethra.

For those who employ the direct cystoscopic

method by preference, both ureters may be catheterized according to the well-known principles of manipulating non-prismatic cystoscopes.

When the neck of the bladder and urethra are to be examined with the water flowing, the instrument is slowly withdrawn, a periscopic view of the urethra being obtained, the supramontane, membranous montane, bulbous and anterior urethra successively appearing. As soon as the membranous urethra is brought into view, it is well to grasp the penis with the left hand, while the right hand manipulates the cysto-urethroscope, in order to prevent reflux of the irrigating fluid, the amount of dilatation of the urethra being controlled both by the height of the irrigator, and the patency of the irrigating faucet.

As a Catheterizing Cystoscope. Although the universal urethroscope is not primarily intended for ureteral catheterization, it may be occasionally used for this purpose, and two No. 6 French catheters may be introduced during the course of other work with this instrument, should the necessity of obtaining specimens from the ureters arise. The technic is the same as that with the direct non-prismatic type of cystoscope (Brown), and the instrument may, therefore, appeal to those who are in the habit of employing the direct method of catheterization. After specimens have been obtained, the catheters may be withdrawn, a closed rubber tip attached to the catheter outlet, and the instrument may then be used as a urethroscope.

For those who are in the habit of employing the Kelly or Luys methods, this instrument may be converted into a Kelly or Luys' endoscope; or, into an irrigating cystoscope of the direct non-prismatic type. By removing the telescope and inserting the magnifying window (Fig. 8a), the universal urethroscope may at once serve as an Elsner-Braasch cystoscope, possessing distinct advantages over the latter in that it will permit of the introduction of one large catheter, and of operating devices.

As an Operating Cystoscope. Although the instrument will not supersede the author's operating cystoscope for special operative work in the bladder, it may be preferred as an operating cystoscope by those who are experienced in the Kelly and Elsner-Braasch methods, since the technic of its application will be found easy to master by such workers. With the instrument introduced in the usual fashion and the bladder washed out, observation cystoscopy is first carried out, a foreign body is viewed, or a ureter put into the field, or a tumor or ulcer inspected, as the case may be.

To fulgurate, a properly selected tip is adjusted to the catheter outlet and the special applicator or wire introduced, just as in the author's operating cystoscope, it being remembered that the absence of a catheter deflector necessitates working at close range to obtain a precise application of the electrode against the tumor.

As a Posterior Urethroscope. In routine examinations the author's indirect cysto-urethroscope

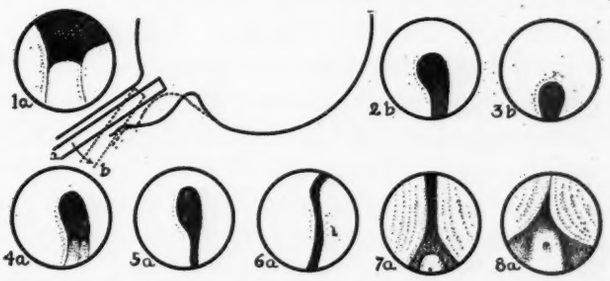

Fig. 30—Diagram depicting (a) the defect in the floor of the sphincter after the Buerger operation for contracture of the neck of the bladder, and the cradle motion acquired in the posterior urethra after such operation; (2-b and 3-b) the views obtained when the instrument is moved in such cradle fashion; (4-a), the relatively large amount of the lateral borders of the sphincter that is seen in such a case of acquired organic relaxation of the sphincter.

possesses distinct advantages over the universal, in that it is not so likely to cause traumatism. Furthermore, the Buerger cysto-urethroscope may be moved backward and forward and pushed inward and outward frequently during the examina-

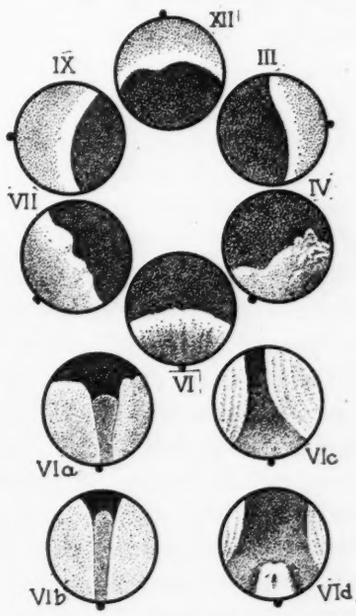

Fig. 31—The same case as Fig. 30 seen with the indirect cysto-urethroscope—the Roman numerals indicating the position of the instrument in terms of the face of the clock.

tion, without incurring the risk of producing hemorrhage, making a more thorough examination possible, even in difficult cases, in which the *universal cysto-urethroscope* would be less satisfactory. However, the value of the universal cysto-urethroscope, i. e., the direct telescopic type of vision in the ure-

thra, should not be underestimated, there being a distinct field of application for this method of examination.

As a Kelly or Luys Endoscope. Certain advantages are offered by the instrument in the presence of the large catheter outlet through which catheters or other devices may be introduced. For those who limit their work to the female urinary tract, the length of the instrument may be reduced from 7 1/4 inches to 6 1/2 or 6 1/4 inches. The possibility of maintaining a dry field by aspiration through the tubule (Fig. 6) at the faucet (Fig. 6e) obviates the necessity of introducing Kelly's special aspiration device.

As for its uses as an air inflation urethroscope or Elsner-Braasch cystoscope (Fig. 8), enough has been said to indicate that it may be so employed, although we ourselves do not find any necessity for invoking the use of these methods.

The Application of the Two Types of Cysto-Urethroscope. In a general way, we may say that in the posterior urethra the indirect prismatic cysto-urethroscope possesses certain advantages over all other instruments in the study of detail. Because of the absence of distortion, it is ideal for the investigation of the finer structural changes in the urethra. The observation cysto-urethroscope (Fig. 10) prevents prolapse of the mucous membrane into the fenestra effectually, and therefore, the images are much more nearly perfect than those obtained with the operating cysto-urethroscope (Fig. 11), or with convex sheath of the cystoscope. If the cystoscopist does not seek to obtain ideal conditions, his work must needs be superficial, because, when details are lost, the keen judgment that is born of exact interpretation, is bound to be missing. For therapeutic work, for the application of the high frequency electrode, and for occasional opening of the prostatic ducts, or the utricle, the operating cysto-urethroscope is preferable. Furthermore, because of the fact that the mucous membrane is stretched, as it were, in planes parallel to the instrument, and kept at a considerable distance from the lens system by water dilation, it is possible to view with greatest accuracy every detail of the mucous membrane, and the slightest abnormality can be detected. The pictures obtained by this indirect cysto-urethroscope are far more beautiful and far more instructive than any that can be obtained by the direct telescopic system.

The four illustrations (Figs. 12, 13, 14 and 15) show what excellent detail may be expected in the posterior urethra.

At the neck of the bladder the pictures with the indirect cysto-urethroscope are typical. There is usually a concave line at the roof, and at the sides, as seen in Fig. 16. The illustrations Fig. 17 and 18 show the usual appearance of the side walls and the floor of the sphincter. It should be noted that all these four regions come equally well into view, the floor of the sphincter appearing just as we draw out the instrument from the bladder into the urethra. This circumstance is worthy of careful consideration, since we will show later, that the direct type of instrument shows but little of the roof of the sphincteric region.

When we come to compare the picture of the posterior urethra and neck of the bladder as viewed with the direct telescopic cysto-urethroscope, and those just described, we will note that with the former a periscopic or panoramic view is obtained

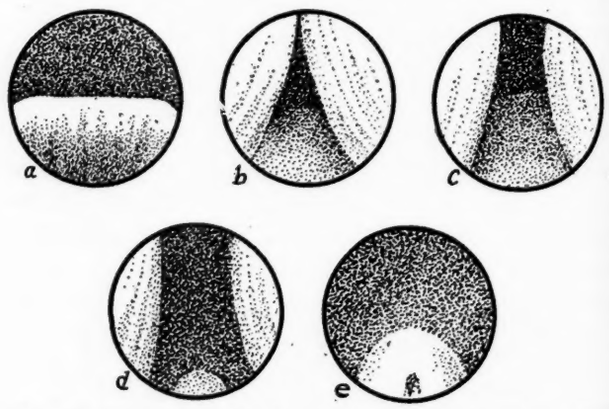

Fig. 32—The picture obtained with the direct cysto-urethroscope in a case of relaxation of the sphincter; a, floor of sphincter b-c, show the recession of the floor of the sphincter.

in planes at right angles to the shaft of the instrument. Distortion must necessarily be expected, partly because of the prolapses of the mucous membrane just beyond the objective end of the tube, and partly becauses of the nature of the lens system. In interpreting the pictures, therefore, due allowance must be made for prolapse of mucous membrane and for the muscular closure of sphincteric and prostatic regions at points just beyond the sheath.

Thus if we study the pictures of the neck of the bladder and posterior urethra with the direct type of the urethroscope (the author's Universal Cysto-urethroscope), we will find (Fig. 19) that when the instrument is at the neck of the bladder, the floor alone comes into view, and instead of the normal convex line seen with the cysto-urethroscope, a concavity is the rule. As we pull out the instrument into the second position in the supramontane urethra, the floor of the sphincter naturally ascends or the sphincter tends to close, so that the sphincteric orifice is seen to rise higher in the field, and still

little or no roof of the sphincter is drawn into view. In the third picture (Fig. 19) with the instrument still farther in the urethra, the floor of the urethra will be seen as a trough, or depression, the lateral walls and roof closing in a horse-shoe fashion over the depressed area.

Figs 20 and 21 show diagrammatically the appearances in two other cases. Fig. 20 again demonstrates how little of the roof of the sphincter and lateral walls come into view, how much longer, apparently, the floor of the sphincter in the supramontane region is, than the roof and side walls, and further would also show the relation of the verumontanum to the roof and side walls of the urethra in pictures 20f and g. We must not be confused by pictures that simulate the lateral intrusions of adenomas of the prostate, when we see rounded bodies jutting in from lateral positions into the urethra and encroaching upon the verumontanum (Fig. 20f).

Fig. 21 (f, g, h, i) show the relation of the verumontanum to the surrounding portions of the urethra, indicating also the difficulty in bringing into view the posterior portion of the verumontanum, and showing how it seems to lie at the bottom of a tunnel, formed by the roof and side walls of the urethra.

When we study these views we can readily understand the value of comparative investigations with the two instruments. It will also be clear now that each instrument has its special sphere of utility in those two most difficult and interesting diagnostic fields, which I shall now describe, namely, first *in obstructive lesions,* and second in *paretic or paralytic conditions of the sphincter.*

The Obstructive Lesions at the Sphincter and Their Diagnosis. I can barely touch upon the visual diagnosis of the lesions of the posterior urethra and sphincter to-night, for time does not permit me to go extensively into this most interesting subject. Let us divide the obstructive lesions into a first group including the so-called "prostatic hypertrophies" or to be more exact adenomas (leaving out of discussion the carcinomas of the prostate, bladder tumors, foreign bodies, or calculi), and a second group, the *contractures of the neck of the bladder,* including here the so-called *median bars.*

An exhaustive discussion of the diagnosis of prostatic adenoma with the use of the optical instruments would take an evening alone, and I can simply refer to a few points that will help understand the comparative utility of the two telescopic instruments.

The cysto-urethroscope is par excellence, the best instrument in this field of diagnosis, becauses it gives us a fairly accurate conception both as to the size of the adenomas, their situation, their direction of growth both in the urethra and in the sphincteric region.

I may be permitted to illustrate with a diagram which displays the situation of the indirect cysto-urethroscope, and its relation to the middle and lateral lobe adenomata in so-called prostatic hypertrophy (Fig. 22).

In this diagram the cysto-urethroscope is shown riding on the lateral lobe adenomata and on the middle lobe, elevated by these into a position which brings it closer to the superior wall of the urethra than to the floor. When the fenestra is opposite the point 1 in the Fig 22, the middle lobe is seen as in the small circle represented below. Depending upon the shape of the middle lobe and its intrusions in the sagittal sense, that is, towards the bladder, will variations in the picture be noted. When the instrument is turned towards the roof, at point 2, we may get a normal concavity or slight incisures, unless the lobes have become so large that the typical sharp V is formed. As we pull out the instrument to the point 3, the two lateral lobes begin to appear separating above and approaching below. At point 4 the two lateral lobes or adenomata appear like two vocal chords separated by a deep cleft which may be dark, because of the inadequacy of illumination, demonstrating how far from the floor the urethroscope really lies. At the point 5, the two lobes begin to separate again in the form of an inverted V, the verumontanum appearing below, very diminutive, as a rule, its size being inversely proportionate to the size of the adenomata. The greater the size of the adenomas, the farther away from the floor the instrument usually is situated, and the smaller the verumontanum.

Most difficult, however, is it, even with this instrument, to accurately estimate the size of the lesions at the sphincter when they are kept forcibly in close proximity with the fenestra of the instrument. Thus, tiny nodules, surrounded by edematous mucous membrane may simulate middle lobes of considerable size, incisures at the neck—always an indication of adenoma formation when they are between two shining rounded bodies—i. e., incisures may suggest adenoma when we are in reality dealing with a fibrotic condition, whilst, on the other hand, intrinsic enlargements of the prostate of considerable size may give practically no evidences of their presence in the urethra.

Fig. 23 will demonstrate beautifully how a very large middle lobe may, if supple and displaceable by

the instrument, appear to be rather small. Most suggestive, however, and usually diagnostic, is a deep incisure, be it laterally placed or at the roof of the sphincter, in the diagnosis not only of middle lobes, but also of lateral adenomata.

Fig. 23 depicts a fairly large soft middle lobe adenoma which was demonstrated by comparison of the cystoscopic findings and findings at operation to have been definitely displaced downward by the pressure of the instrument, so that it appeared in the picture much smaller that it really was, having been bent upon itself, the true amount of intravesical intrusions having escaped observation through the instrument. The dotted line in the upper figure illustrates the position of the sphincter, the adenoma meeting the vesical neck at the point 2 in the form of a deep incisure, and on the other side fusing with the surrounding parts in a concave line. With the instrument at point 1, and a greater portion of the lobe pressed downward, the picture seen in the circle below was obtained. At the point 3 the typical incisure so characteristic of adenomata was found, at 3 and 4 (4 being the roof of the sphincter) nothing abnormal, and at 5 but a slight indication of lateral lobe formation.

In short, these pictures apprised us, firstly, of the inadequacy of even the best of instruments in correctly estimating intrusions in the region of the sphincter, and, secondly, suggest the importance of lateral incisures in the recognition of the presence of adenomata.

The direct telescopic method or universal cysto-urethroscope is of but limited value in the advanced cases of adenoma, but may give us some valuable information of early intraurethral changes, in that it may permit us to differentiate very nicely between rigid lateral adenomata in the posterior urethra, and between those doubtful pictures of lobes that are simulated by prolapsing mucous membrane. In the former, the rule is to see rigid protruding lateral bodies over which the mucous membrane is not displaceable, is thin, glistening and covered with vessels; in the latter (which may occur in suspected paralytic cases), the mucous membrane has a tendency to fold, may be redundant, is easily displaceable and velvety.

Contracture of the neck of the bladder. In the cases of contracture of the bladder both the indirect and the direct cysto-urethroscope can give valuable information, though it must be emphasized that there are cases which may not be cleared up by the use of either of these instruments, either because the lesions present no intravesical intrusions recognizable through the telescope, or because the pathological changes are of a diffuse variety involving the eccentric portions of the sphincter and prostate, without surface alterations. Theoretically, the two best methods of diagnosis are the visual method, which sees the sphincter from the vesical side, such as the view obtained at suprapubic cystotomy, and secondly, the palpatory method, with the use of the finger, which alone can estimate correctly the amount of induration, dilatability, and contracture of the sphincteric ring. If we divide the cases as they have presented themselves to me clinically and pathologically into the following five groups, we will see that it is essential to subject them to careful inspection with both instruments before a definite

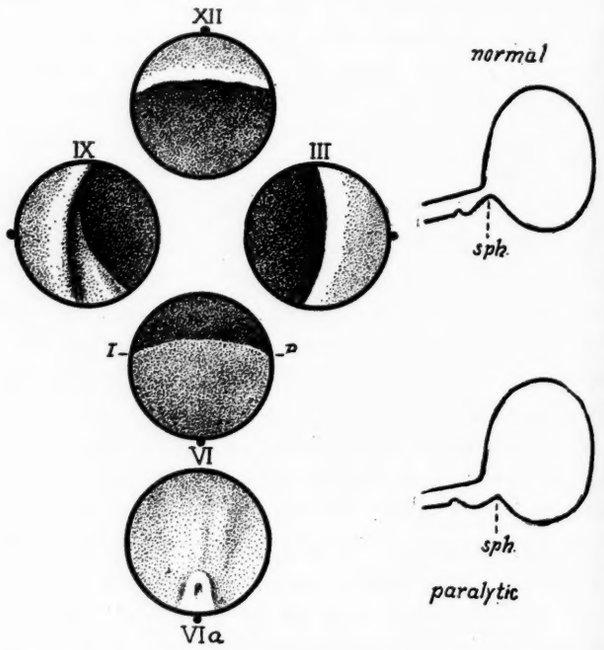

Fig. 33—On the left, the views obtained with the indirect cysto-urethroscope in a case of the paralysis of the sphincteric region; on the right a sagittal section of the normal and paralytic sphincter and bladder.

estimation of the juxta-sphincteric changes can be obtained.

Thus, we may have to deal with any of the following varieties:—the mixed cases, where small precocious adenomas are present in young men, together with more or less fibrous contracture of the sphincter region, with or without distinct bar formation. Second, a distinct bar transversely situated in the region of the inferior margin of the sphincter. Third, the subcervical and subtrigonal adenomas. Fourth, the fibrous changes of the sphincteric region with extensive fibrosis and enlargement of the prostate, without any true adenoma. Fifth, fibrosis of the lateral and anterior margins of the sphincter without involvement of the floor.

The direct telescopic cysto-urethroscope will be found exceedingly valuable in bringing to view the

rigidity of the sphincteric margin, its lack of dilatability, the short distance between the trigone and sphincter, and perhaps any intra-vesical intrusion in the region of the so-called median bar formation. It is less valuable, on the one hand, than the indirect cysto-urethroscope in the study of the lateral margins and the superior wall of the sphincter, these being almost invisible through the direct instrument. On the other hand, it gives exceedingly valuable information regarding the rigidity of the lateral walls of the prostatic urethra, which by reason of the inflowing water, can be easily recognized as being either relaxed or fibrotic.

Fig. 24 shows the changes in a case of contracture of the neck of the bladder, where there was a distinct median bar. Between the region marked b-s (s representing the sphincter) (Fig 24-I) there was a distinct elevation, which at operation was demonstrated to be a median bar. Fig. 24-II shows the short distance between the bar and urethral opening. The other figures show a urethra approaching the normal, except for the Figures 24-VIII and IX, which show redundancy of the lateral walls in the region of the posterior urethra. This condition, however, can be distinctly differentiated from adenoma by the supple and displaceable nature of the mucous membrane.

In another case of contracture of the neck of the bladder the direct telescopic instrument demonstrated beautifully the shortened trigone (Fig. 25c), the prominent sphincter, the findings being corroborated at operation.

Figure 25a depicts the fibrotic inferior margin of the sphincter found at operation, the dotted lines indicating the region excised in the operation, which I perform and recommend for this condition. Fig. 25b shows a diagrammatic sagittal section of such a bladder, and illustrates also a prominent mucous lip found in this case, limiting the bar behind, but not being responsible, in my opinion, for the obstructive condition encountered. Fig. 25c represents the bar, the shortened trigone and the trabeculated bladder, and Fig. 25d offers nothing particularly striking, being a view with the direct cysto-urethroscope, which revealed nothing suggestive in the posterior urethra, other than a somewhat elonged supramontane urethra.

In another type of fibrosis of the prostate, which clinically and anatomically produces the same rigidity of the sphincter, that we find in true contracture of the neck of the bladder, but where the lesions occupy or involve the whole of the prostate, the findings may be practically nil (Fig. 26). For, in this type, the whole sphincteric region and the trigone behind it, will be found at operation to be raised up in mound-like fashion by virtue of the increased size of the prostate, and although no bar is present, all the contiguous structures are fibrotic, undoubtedly due to a chronic inflammatory process. Such cases may be mistaken, even at the operating table, for carcinoma, and, clinically, when they occur in men of advanced years, may be regarded as carcinomas, particularly since the prostate feels very much indurated per rectum. Neither the direct nor indirect cysto-urethroscope give very much information in such cases, as the figures show. Nor would we expect much light, for the reason that no definite bar is present, and no intrusion, other than a general mound-like elevation.

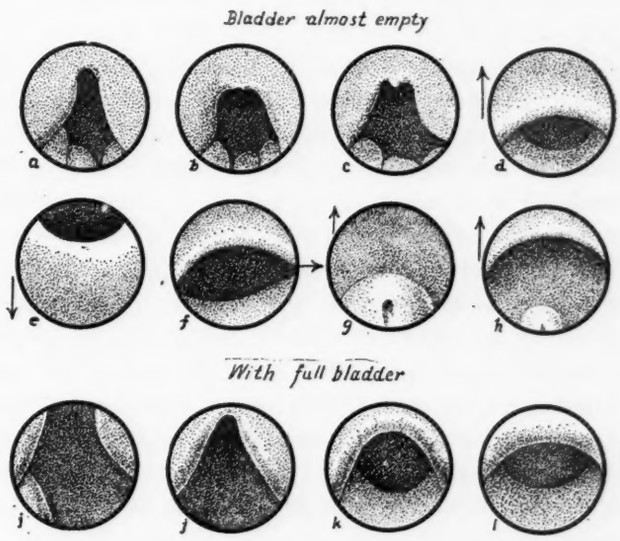

Fig. 34.—Above eight views (a-h) with the direct cysto-urethroscope seen in case depicted in Fig. 33; below (i-l) the same case when the bladder was full.

a, b, c—show the relaxed floor of the sphincter;

d, e, f, g, h,—show the abnormal increased moblity of the instrument, the arrow indicating the direction taken by the objective end of the instrument; in f, the instrument is midway between positions d and e. In i and j, the floor of the sphincter has entirely disappeared.

Finally, I shall demonstrate a not uncommon form of short supramontane urethra, which can give the clinical symptoms of contracture of the neck of the bladder, but of whose pathology I know very little, since I have never had the opportunity of inspecting the neck of the bladder through the opened bladder in such a case (Fig. 27).

It may be well before going to the subject of the paralytic sphincters to dwell in short compass on the changes that can be demonstrated in the region of the sphincter, weeks or months after the operation, which I perform for contracture of the neck of the bladder, because the utility of the direct cysto-urethroscope in differential diagnosis between operative or artificial organic insufficiency of the floor of the sphincter, and paralytic insufficiency of the same re-

gion thereby, will be elucidated. Figure 28 will illustrate the prominent bar that we sometimes see in cases of contracture of the neck of the bladder, showing how the sphincter may be closed by such an overhang. In the next illustration (Fig. 29) the sphincter is seen to be open as the bar was pulled back by the fixation forceps at operation. Now, when this region is excised with a knife in clean-cut fashion through the suprapubic route, we subsequently get perfect restoration of the region, as far as the integrity of the mucous membrane is concerned, and amelioration of the symptoms in about 75% of the cases. If we examine such cases after an excision of the floor of the sphincter has been performed, and after the parts have already healed, we will obtain the pictures now to be shown. In Fig. 30 we will see that there were definite evidences of an absence of a sphincteric floor at the site of excision (1a). In addition to this, the instrument will be found to attain, by virtue of the dilation of this region, a certain increased degree of mobility over what we regard as normal. So that when the instrument is pulled out somewhat, pictures 2b and 3b may be obtained, showing varying amounts of the roof of the urethra, pictures that can only be produced when a cradle motion of the urethroscope is permitted. Such a degree of mobility is not normal. Elsewhere in the urethra there is nothing particularly abnormal, except for the fact that the lateral walls are somewhat more rigid than they normally are, and appear in 7a and 8a as lateral lobes, and may be confused with lateral adenoma.

In short, application of the instrument is valuable here first, in demonstrating a defect in the floor of the sphincter; second, in the recognition of the phenonmenon of an acquired increased mobility of the objective end of the sheath—this being a circumstance, the significance of which must be differentiated from a similar condition occurring in the relaxed and paralytic sphincters.

If we now examine the same case with the indirect cysto-urethroscope (Fig. 31), we will find that somewhat less information is obtained in the region of the sphincter, but in the supramontane urethra, the excavation can be well demonstrated, and the rigidity of the lobes also just above, and on either side of the verumontanum.

Paralytic conditions of the sphincter. Indirect and direct cysto-urethroscope are both valuable in a study of conditions of relaxation of the sphincteric region, the direct telescopic method giving possibly more information than the indirect, in that we have at our disposal a means of estimating the *functional activity of the sphincter.* When the function of the sphincter is partly in abeyance, when it is relaxed, as it were, it is possible to dilate it much more easily than in the normal by means of the irrigating fluid. The examining instrument acquires greater ease of motion in the urethra, and can often be pushed backwards and forwards without causing bleeding and without meeting any resistance at the sphincter. This circumstance alone may be regarded as indicative of sphincteric relaxation.

We may distinguish between the mild or early stages of sphincteric relaxation, or the well-developed stage, in which the floor of the sphincter has lost its tone completely, and retracts so that the internal sphincteric orifice opens in a funnel-shaped fashion into the bladder.

Not only is the direct type of cysto-urethroscope of great value in cases of mild relaxation of the sphincteric region, when it can be definitely shown to have acquired greater ease of motion, in a to and fro sense, but particularly is it valuable, when it shows that the floor of the sphincter has definitely retracted, as shown in a case from which the Fig. 32 was drawn. Here we see in Fig. 32b, c, d that the floor of the sphincter is dark a good distance from the field of vision, undoubtedly relaxed. Whereas much more of the lateral aspect of the sphincter comes into view, than in the normal cases. The relaxation in the region just behind the verumontanum is also seen (Fig. 32b).

Where the paralytic condition of the sphincter is well developed, the cysto-urethroscope of the indirect type may give valuable information, as seen in Fig. 33.

On the right a sagittal section of the bladder, and sphincteric region, with the normal and the Paralytic sphincter compared are depicted. On the left the pictures with the indirect cysto-urethroscope are shown, the floor of the sphincter being practically absent, and seen lying far away from the instrument, at the level (I.B.), where it has the appearance of an interureteric bar, and not the prominence of the normal floor of the sphincter. Between the level (I.B.) and the verumontanum, there is quite a pouch, which is the tunnel into which the posterior urethra and neck of the bladder have been converted.

If we compare these pictures with the views obtained with the direct cysto-urethroscope in the same case (Fig. 34), we will note that when the bladder is only moderately full or almost empty, that the floor of the bladder with the direct type of instrument, shows relaxation, often plication, as in Fig. 34a, b, c. We will also see that the roof and side walls come into view, which is distinctly ab-

normal for this type of instrument. It indicates that since the floor of the sphincter has receded, the mouth of the urethra has widened, that the instrument can get a view of the roof and sides, the floor lying at a distance and poorly illuminated.

A still more valuable phenomenon, demonstratable in such cases of paralytic sphincter, is the acquired increased mobility of the instrument, both at the sphincter and in the posterior urethra; so that when we move the ocular of the instrument downward, the objective moving up towards the roof of the urethra, Fig. 34c is obtained, showing below the relaxed sphincter, in the center the wide opening of the internal vesical orifice, and above the roof of the sphincteric margin. That the instrument can be moved also in the other direction is seen in Fig. 34e, as indicated by the arrow. In the mid position (Fig. 34f) the abnormally large outlet of the bladder is seen. Similarly, in the region of the verumontanum, increased mobility of the instrument can be readily demonstrated.

Even more striking are the pictures, when the bladder is full, when it can be shown as in Fig. 24a, b, that practically none of the floor of the sphincter comes into view, and only the side walls are viewed, and that it is not until we enter the urethra, and approach the region of the fossula prostatica, just behind the verumontanum, that the floor of the urethra comes into the field.

In short, characteristic, for the paralytic and relaxed conditions are—1, the increased ease of motion in the direct cysto-urethroscope in a to and fro sense (motion of translation); 2, the absence of traumatism, even when a very slight amount of irrigating fluid is allowed to flow through; 3, the retraction or disappearance of the floor of the sphincter, with an increased amount of roof and side walls in the picture; and, 4, the increased mobility of the instrument moved in a cradle fashion in the neck of the bladder and posterior urethra. All these facts demonstrate a dilatation, or at least, a muscular insufficiency of both sphincter and region of the posterior urethra.

AUTOMOBILE ACCIDENTS.

Vital statisticians are observing that while the communicable diseases have responded more and more each year to the measures instituted by health authorities for their control, injuries and fatalities resulting from the growing use of automobiles are steadily climbing. Where formerly diseases like typhoid fever, scarlet fever and others played an important rôle in mortality tabulations, fatalities due to the automobile are today as numerous as some of the serious infections.—L. FRANKEL, *in Medical Insurance and Health Conservation.*

DIAGNOSIS AND TREATMENT OF BRAIN INJURIES WITH OR WITHOUT FRACTURE OF THE SKULL*

WILLIAM SHARPE, M.D.
NEW YORK CITY

The mortality resulting from brain injuries is very high. During the period from 1900 to 1910, the mortality figures at three of the large hospitals in New York ranged from 46 to 68 per cent. of all cases of brain injuries. In a report recently published by *Dr. Besley of the Cook County Hospital of Chicago regarding 1,000 consecutive patients having fractures of the skull, the mortality was 53 per cent. This death rate is indeed appalling, and it undoubtedly accounts for the attitude of many doctors and most hospitals toward patients having fractures of the skull, particularly those of the base. If the patient recovers, remarkable—he had a fraccture of the skull. If he dies—well, he had a fracture of the skull.

It is this attitude of comparative hopelessness in the treatment of brain injuries that has allowed these cases to be almost neglected in the general hospital. I well remember being severely reprimanded as a house officer for having admitted to the hospital from the ambulance a fracture of the base of the skull, and not having sent the patient to Bellevue Hospital. As a house surgeon, my instructions were to keep the beds free of fractures of the base of the skull, the reason being that so little apparently could be done for these conditions. The patients either improved after a long convalescence, or more frequently they died, the treatment other than the ordinary routine palliative procedures being of little or no benefit.

The belief has long been maintained that the patients with brain injuries, especially following fractures of the base of the skull, get along just as well without operation as with operation. This position is well taken if the patients requiring operation are not operated on until they reach the dangerous stage of medullary compression and even the later stage of medullary edema; then it matters very little whether the patient is operated on or not—in fact, what chance of recovery the patient may have is taken away by an operation at that late and dangerous period of medullary edema, the operation being just an added shock, so that death is usually hastened. The mortality from 1900 to 1910 was 87 per cent. following operation on patients who

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* Read before the New York and New England Association of Railway Surgeons, November 8th, 1918.

* Besley, F. A.; A Contribution to the Subject of Skull Fractures. The Journal A. M. A., Jan 29, 1916, p. 345.

showed signs of high medullary compression and edema. The patient, however, should not be allowed to reach that dangerous medullary stage. *It should be anticipated by repeated examinations and tests, and if the early signs of definite increase of the intracranial pressure appear, then the operation should be advised immediately.*

An early operation is advisable, not only as a means of saving the life of the patient, but also to lessen the danger of post traumatic conditions, so common after fractures of the skull. These conditions of nervous instability, such as marked depression, irritableness, persistent headache and even epilepsy following brain injury, especially as the result of basal fractures, are due in the majority of cases, I believe, to the resulting unrelieved increased intracranial pressure prolonged over a period of several weeks or more, and frequently resulting in the chronic edematous, swollen brains, so commonly observed at later operation on these patients. The cortical irritability may become so high as to allow epileptiform seizures to occur.

The diagnosis and treatment of brain injuries has advanced most rapidly within the last few years. The clinical symptoms and signs are so varied and frequently so confusing that it is a most interesting field; apparently in many cases the more extensive the fracture of the skull, the less seriously is the brain injured, and to the contrary, *the most dangerous brain injuries* frequently are not even associated with a fracture of the skull. As is well known the fracture in these cases (if we exclude depressed fractures of the vault which should always be elevated or removed) is possibly the most unimportant part to be considered in the treatment, whereas the presence of a marked increase of the *intracranial pressure* with or without a fracture of the skull should immediately cause the patient to be withdrawn from the large group of patients properly treated by the expectant palliative method, and the advisability of an early operative procedure to relieve the increased intracranial pressure should be considered.

During the three years 1913, 1914 and 1915*, I examined and treated personally 239 adult patients having acute brain injuries with or without a fracture of the skull; in only 79 of these 239 patients (that is, 34 per cent.) were there marked signs of an increased intracranial pressure, and therefore only these patients were operated upon to relieve this increased pressure, whereas the remaining 160 patients did not show definite signs of an increased intracranial pressure and were therefore treated by the expectant palliative methods of absolute quiet, ice helmet and catharsis; if in shock, then the routine treatment of shock was administered. It is thus seen that only one-third of the patients having brain injuries with or without a fracture of the skull were operated upon, and approximately this same ratio has continued during the past year. The careful selection of patients, in regard to the advisability of an operation, the type of cranial operation used, the ideal time for performing the operation, are the factors that have made it possible to lower the mortality of fractures of the skull from the general average of 50 per cent. to 30.7 per cent. at the Polyclinic Hospital. If we exclude the moribund patients, dying within three hours after admission to the hospital from shock, internal injuries, the fracture of the skull being but an incident in the patient's general condition, the mortality is lowered to only 19 per cent.

In the treatment of brain injuries with or without fractures of the skull, if the patient is allowed to develop definite paralyses, a lowered pulse-rate, Cheyne-Stokes respiration and the appalling signs of extreme intracranial pressure, I agree he will "get along" just as well without operation as with one—the mortality being 50 per cent. and over. Patients with brain injuries should not be allowed to reach this dangerous stage of medullary compression due to the high intracranial pressure, but it should be anticipated by accurate diagnostic methods. If a marked increase of intracranial pressure is ascertained, then an early relief of it should be advised, not only to save the life of the patient but to lessen the post-traumatic conditions of changed personality, either of the excitable or the depressed type, persistent headaches, early fatigue, occasionally epilepsy and that long train of post traumatic conditions due in the majority of instances to a prolonged increase of this intracranial pressure.

Besides the lowered pulse and respiration rates, which are comparatively crude signs of intracranial pressure, and the irregular Cheyne-Stokes type, the latest signs of extreme intracranial pressure, with its resulting medullary compression, the two most valuable procedures for determining a definite increase of the intracranial pressure are the examinations of the fundi of the eyes with the ophthalmoscope and the measurement of the pressure of the cerebro-spinal fluid at lumbar puncture by means of the spinal mercurial manometer.

Although it is rare for a measurable papilloedema and "choked disks" to occur in these cases of traumatic intracranial lesions with or without a fracture of the skull, yet the earlier and therefore milder

*Journal of the American Medical Association, May 13, 1916.

degrees of an edema of the optic discs should be most carefully "watched for" with the ophthalmoscope as being one of the accurate signs of the presence of a definite increase of the intracranial pressure. The ophthalmoscope and especially the direct method is a most valuable means in the diagnosis of cranial lesions. Rarely do these fundal examinations reveal an increased intracranial pressure within six hours after the head injury; this is due to the presence of shock in these patients who later exhibit the marked signs of intracranial pressure. As head injuries are usually accompanied by shock of varying degrees, naturally the blood pressure is low so that even if a large intracranial vessel was torn, there could be only a comparatively small amount of hemorrhage because the resulting increased intracranial pressure would soon be greater than this lowered blood pressure of shock, and therefore the bleeding would cease. As the patient recovers from the condition of extreme shock, the blood pressure rises and then more bleeding can occur intracranially until the intracranial pressure again equals the lowered blood pressure. Finally, if the patient survives this condition of shock, then the blood pressure will be continuously greater than the intracranial pressure, so that this resulting increased intracranial pressure produces its characteristic signs in the fundus of the eye—a dilatation of the retinal veins, and an edematous blurring of the nasal halves, and if still higher, then an edematous obscuration of the temporal halves of the optic disks. A measureable papilloedema and "choked disks" occur only when the intracranial pressure is extreme, due to a large intracranial hemorrhage of slow formation, such as the extradural middle meningeal type—just as in brain tumors or when the ventricles are blocked producing an internal hydrocephalus. Naturally, if the intracranial hemorrhage forms very rapidly and is of large amount, the patient usually dies within a couple of hours so that "choked disks" have very little time to be produced. The shock following head injuries usually lasts for about six hours in the patients who survive and, therefore, it is rare within these first six hours for the ophthalmoscope to reveal definite signs of an increased intracranial pressure. It may be also noted that the patients who do not survive the condition of shock usually die within the first six hours. It is, therefore, of the greatest importance to recognize these early signs of increased intracranial pressure by repeated ophthalmoscopic examinations and to realize that these edematous blurrings of the optic disks are more than being merely within physiological limits. It is true that in cases of myopia there is normally an obscuration of the disk outlines, but these patients can be excluded by the second and following test, which should always be performed.

The most accurate known means for ascertaining the presence or absence of an increased intracranial pressure is the measurement of the cerebro-spinal fluid at lumbar puncture by the spinal mercurial manometer. It is similar to a blood pressure apparatus, as safe as a lumbar puncture when properly performed, and by it the varying degrees of intracranial pressure can be carefully recorded. The normal pressure is 5-9 mm. of mercury, so that if a pressure higher than 15 mm. is obtained at lumbar puncture, then we know that the signs of intracranial pressure, as shown in the fundus of the eye, are confirmed. This method of estimating intracranial pressure is most important in the differentiation of the intracranial condition of spastic paralysis due to hemorrhage at birth from those other causes of the so-called Little's disease. In other intracranial conditions producing the extreme stages of papilloedema and "choked disks," and even their end results of secondary optic atrophy, as in neglected cases of brain tumor, it is not necessary to confirm the ophthalmoscopic findings in order to make a diagnosis of an increased intracranial pressure. If, however, in these traumatic lesions of the brain, we must wait until a "choked disk" results from extreme intracranial pressure in order to state that the intracranial pressure is high, and if we must wait for the pulse-rate to descend to 60 and below and the respiration and pulse to assume the irregular Cheyne-Stokes character of medullary compression, then undoubtedly the mortality of these patients will be 50 per cent. and even higher. Patients should not be allowed to reach this dangerous stage of medullary compression—this stage should, and can be, anticipated by repeated ophthalmoscopic examinations and the measurement of the pressure of the cerebro-spinal fluid at lumbar puncture.

In selected cases of mild intracranial pressure due to trauma, very frequently the convalescence can be shortened, the headaches relieved and the general condition of the patient greatly improved by lumbar puncture, and if necessary, repeated lumbar punctures; not only will the edematous "wet" condition of the brain be drained in this way, but a prolongation of the increased pressure will be avoided and therefore the definite danger of post traumatic conditions, so common in these cases, be lessened. Naturally, this method is only applicable to mild selected cases and lumbar puncture should never be advocated as a means of drainage in patients having high intracranial pressure or in sub-

tentorial lesions for fear of a consequent medullary compression in the foramen magnum.

We now come to the most important and the difficult question in the treatment of brain injuries with or without a fracture of the skull: "If an operation is advisable, when should it be performed?" This question can more easily be answered by stating the two periods when the operation should *not* be performer. Naturally, we must exclude the majority (about two-thirds) of fractures of the skull which do not have a definite increase of the intracranial pressure and therefore no operation is indicated. (The depressed fractures of the vault naturally should always be elevated or removed.)

The two periods in which an operation is distinctly contra-indicated in cases of brain injury, are, first, the condition of severe shock in the very beginning, and second, the condition of medullary collapse — the death knell of the patient. A cranial operation upon a patient—no matter how badly the skull is fractured, nor how extensive the intracranial hemorrhage seems when the patient is in the condition of severe shock with a pulse-rate of 120 and higher, when the operation during shock takes away whatever chance the patient may have of surviving the shock to which the operation merely hastens the exitus. No patient having a brain injury should be operated upon in this condition of shock; the mortality is most high. If a patient does recover from an operation in this period of extreme shock, then he recovers in spite of the operation. Cranial operations for brain injuries in this stage of shock were frequently performed in the past and most disastrously, and thus operations were almost discredited in the treatment of brain injuries. The natural reaction following these early operations in the period of severe shock was to wait until there could be no possible doubt that the patient was going to die, unless a cranial operation was performed; that is, the patient was permitted to reach the period of extreme medullary compression—a pulse-rate of 50 and below, irregular Cheyne-Stokes respiration and pulse and profound unconsciousness—before a cranial operation might be considered. This is a most dangerous stage for these patients to reach, and it is doubtful whether recovery can occur even with an operation at this period. But if the patient has struggled through this period of medullary compression, and finally reaches the stage of medullary edema, when the pulse-rate begins to ascend quickly to 120 and higher, respirations become rapid and shallow—that is, the stage of medullary collapse—then we have the second period when no patient should be operated upon—they all die, operation or no operation. I feel if these two extremes can be avoided and the latter medullary collapse can certainly be anticipated in the operative treatment of brain injuries and their signs cannot be overlooked, that the rational treatment from an operative standpoint depends upon the presence or not of a definite increase of the intracranial pressure whether there is a fracture of the skull or not. In some of the most serious cases no fracture was present—either to be ascertained at operation or at autopsy.

The aid of the Roentgen Ray is important in the diagnosis of these traumatic cases only in patients with doubtful depressed fractures of the vault, and in latent fractures of the skull, where the bump is apparently so trivial that the patient might not be examined and treated as carefully as the condition would warrant. On the contrary, no patient with high cranial pressure should be obliged to wait "over night" or for a period of hours merely to secure a Roentgen Ray picture of the skull; it is of no importance in the treatment of these acute intracranial lesions whether a fracture is present or not. If there is a high intracranial pressure, as shown by the ophthalmoscopic examination and by the measurement of the pressure of the cerebro-spinal fluid, then a cranial operation is indicated to relieve this increased intracranial pressure, both by enlarging the intracranial cavity and by the draining of possible hemorrhage and cerebro-spinal fluid. It is not so much a question of removing the hemorrhage as it is of lessening the increased intracranial pressure; whether that pressure is due to hemorrhage or edema, the operative indication is the same. Many cases of head injuries at autopsy have revealed no hemorrhage at all—merely a "wet edematous swollen brain, but sufficient to cause medullary compression and the death of the patient.

If an operation is considered advisable to relieve the increased intracranial pressure, then the operation of choice is the sub-temporal decompression and drainage; if there are no definite localizing signs of the intracranial lesion, then the decompression should always be performed on the right side in right-handed patients in order to lessen thereby any possible operative damage to the adjacent motor speech area. In these cases, it is not so important to remove the hemorrhage as it is to offset its pressure effects. In cases of depressed fractures of the vault showing definite signs of a high intracranial pressure, it is better surgical judgment to precede the elevation or removal of the depressed area of bone by a sub-temporal decompression so that when the depressed bone is removed there will be little or

no danger of the underlying cerebral cortex being damaged by its protrusion through the bony opening; as the sub-temporal decompression exposes a comparatively silent area of the brain—a portion of the tempero-sphenoidal lobe—its protrusion and possible damage would not appear clinically, whereas, a partial paralysis, impairment of sensation or of vision might occur, and frequently does result from operations performed over the more highly developed areas of the cerebral cortex. Besides, the sub-temporal route provides not only an excellent exposure of the middle meningeal artery and that portion of the brain so frequently involved in fractures of the skull, but it affords drainage to the middle fossa of the skull—the chief intracranial cistern—at its lowest point at the base of the skull; again, the thinness of the squamous portion of the temporal bone makes the operation a less difficult one technically. The vertical incision (and not the usual curved incision) should be used not only to make the operative hemostasis more effective in that the trunk of the temporal artery is clamped at its lowest point at the very beginning of the operation and therefore there is no bleeding from its branches, but this incision also permits the removal of the underlying squamous bone as far as is possible beneath the temporal muscle—and yet the attachment of the temporal muscle to the parietal crest is left intact so that a firm closure of its separated muscle fibres is assured; this is a most important point in cases of high intracranial pressure as in brain tumor where a cerebral hernia or fungus might result from an imperfect closure of the temporal muscle. The insertion of silver and celluloid plates and other foreign bodies beneath the scalp is to be most strongly condemned.

If the intracranial pressure is so high that the cerebral cortex tends to protrude through the bony opening, it is frequently wiser in selected cases to perform a similar operation upon the opposite side of the head immediately after the first operation. I have been obliged to do this in only five per cent. of the patients; the ones having a swollen edematous brain—"water-logged" as it were, where the drainage of blood and cerebro-spinal fluid is slight and not sufficient to cause a marked decrease of the intracranial pressure. In some doubtful cases, it is better judgment to wait for one or two days and even longer before the second operation is considered advisable. The rubber tissue drains are usually removed on the first or second day post-operative, and the hospital convalescence ordinarily requires at least two weeks. Naturally, these patients should not enter into their former active life for a period of three months and even longer; a too early return to strain and stress of modern life predisposes them to many complaints—both subjective and objective. Repeated examinations of the fundus of the eye and of the superficial and deep reflexes are most important in estimating the physical normality of the patient.

The end results of patients having injuries with or without a fracture of the skull have been an interesting study. It has become quite a common belief that once a man has had a fracture of the skull and then recovers, he is never the same person again. In 1912, I examined the records of three of the large hospitals of New York City during the decade of 1900-1910; the mortality of fractures of the skull was 46-48 per cent.; the mortality of the patients operated upon was 87 per cent. This high percentage was due undoubtedly to the operation being postponed until the extreme stages of medullary compression and edema, and also to the fact that the operation performed was the "turning down" of a bone flap—a much more formidable procedure than a decompression—and then the replacing of the bone so that even the benefits of a decompression were prevented; besides, in many cases, the dura was not opened, and, as the dura is inelastic in adults, no adequite relief of the pressure could possibly be obtained. Of the patients, however, who were finally discharged as "well" or "cured," I was able to trace only 34 per cent., but of these 34 per cent. of the total patients found, 67 per cent. of them were still suffering from the effects of the injury—that is, two-thirds of them were not as well as before the injury! The chief complaints were persistent headache, a change of personality of the depressed or of the excitable type and thus emotionally unstable, early fatigue making any prolonged mental or physical effort impossible and thus the inability to work, lapses of memory, spells of dizziness and faintness, and even epileptiform seizures in a small percentage of them. In examining the hospital records of the patients having these post-traumatic conditions, it was most interesting to ascertain that these were the patients—and there were but few exceptions—who regained consciousness gradually after several days and remained in the hospital for a period of four weeks and longer, whose charts made frequent mention of the severe headache and a low pulse rate of 60 and in some cases below 60—that is, the usual clinical signs of an increased intracranial pressure; an ophthalmoscopic examination had rarely been made. Many of these patients still showed the results of the increased intracranial pressure in their fundi and at

lumbar puncture, and these were the ones upon whom a cranial decompression even at this late date caused a marked improvement; the operative findings were always associated with a "wet" swollen edematous brain. Many of the so-called post-traumatic neuroses are in my opinion frequently superimposed upon this definite organic basis as the result of the brain injury. The treatment, therefore, of brain injuries should not be limited merely to the recovery of the patient as far as life is concerned, but it should also be directed toward obtaining a normal individual—approximating as closely as possible the condition of the patient before the injury.

MORULAR OVARIAN NEOPLASMS; THE SO-CALLED OVARIAN DERMOID CYSTS; A BRIEF LITERARY REVIEW, INCLUDING THE REPORT OF A CASE.

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(Continued from April issue.)

Histo-pathology.—Little further need be said concerning the histo-pathologic aspects of complex ovarian neoplasms. All three of the germinal layers invariably contribute to the production of such tumors, as demonstrated by the presence of osseous, cutaneous, and visceral tissues or elements. According to Cumston a "dermoid" may be properly classified as an abnormal organ, composed of perfectly normal tissues, identical with the skin, and capable of giving rise to all the pathologic productions to which the cutaneous surface is liable,—such as cysts, keratogenic productions, verruca, etc., which sometimes present a high degree of development.

Hair in varying quantity is one of the most frequently observed cutaneous derivatives in the complex type of ovarian neoplasms; partially imbedded teeth and irregular fragments of compact bone are not uncommon; cartilage, glandular tissue, mucous and serous membranes, muscle and nerve fibers, cerebral substance, imperfect eyes, partially formed fingers with nails, mammæ, and many other structures have been identified by histologic examination. In one recorded instance (Autenrieth) more than three hundred teeth were found. The teeth usually project slightly from the neoplastic wall, some are surrounded by tufts of hair, others are loosely inserted into imperfectly formed alveoli. Sebaceous material in greater or less abundance is almost invariably present, regardless of the location of the neoplasm.

According to Senn, in the embryo the ovaries develop from the genital ridge, which at an early date is intimately associated with the cells lining the peritoneum and connected with the peritoneal funnels. The origin of the Wolffian duct is intimately connected with the epiblast; consequently the ovaries are the site of the most complicated histologic processes during their development, and must necessarily frequently become the site of rests which, when excited to active tissue proliferation, furnish the material for the different kinds of "dermoids." Cyst walls which represent the external skin in their structure frequently contain all the appendages of the skin. The papillæ of the skin are usually not well developed. Cysts with a derma lining contain the product of epithelial proliferation, which forms a pultaceous mass, variable in consistency, resembling in every respect the contents of sebaceous cysts. The lanuginose hair may consist of a fine down or may grow to the length of several feet. The hair is of a yellowish or reddish color, "and as it is shed from the follicles it accumulates in the cyst in masses pasted together by the sebaceous material." (Senn.)

It is estimated that between three and four per cent of all ovarian tumors are morular or blastodermic in character; they may be either unilocular or multilocular, and likewise unilateral or bilateral. In multilocular neoplasms one or more loculi may contain cutaneous and osseous derivatives, while others may be simple serous or mucous cysts. The proportion of bilateral compared with unilateral cases is about one to seven. (Mantel, Gebhardt.) Vaccari found both ovaries involved in fourteen per cent of instances.

Symptomatology and Diagnosis.—As the clinical symptoms induced by morular ovarian neoplasms are essentially those noted in ordinary tumors involving the adnexa, ante-operative differential diagnosis is more often than otherwise absolutely impossible. In the majority of instances, where the diagnosis of "dermoid" cyst has been made prior to operation or necropsy, facts were merely assumed which happened to be later verified. The nature of the neoplasm may be determined by röentgenoscopy in a small percentage of cases. Let it be emphasized that, despite the skill and erudition of the observer, there are no discoverable pathognomonic ob-

jective clinical signs by which the nature of complex ovarian neoplasms may be positively recognized.

The retardation in development of such tumors is not invariably diagnostic, because simple ovarian cystomata oftentimes progress slowly and induce no symptoms by which their character may be positively differentiated. The "lack of elasticity" imparted to the examining fingers upon superficial or deep palpation, upon which much emphasis hitherto has been placed, possesses no especial diagnostic significance, since this phenomenon may be observed in any variety of ovarian tumor.

It is admitted that ovarian neoplasms in youthful individuals are more likely to be morular; but the exceptions are so numerous that it may be asserted with a reasonable degree of certainty that the age of the patient bears no definite relationship to the character of the neoplastic formation.

In women of child-bearing age the gradual abdominal enlargement, especially in bilateral ovarian neoplasms, has oftentimes been mistaken for normal utero-gestation; and unilateral tumors have been confounded with extra-uterine pregnancy, salpingitis, appendicitis, etc. The pressure symptoms are likely to be identical, regardless of what may be the determining causative factors.

Menstrual disturbances and irregularities, upon which considerable emphasis has also been placed by various observers, are of no especial importance from a diagnostic standpoint. While amenorrhea, dysmenorrhea, menorrhagia and metrorrhagia may occur during the development of moroular ovarian neoplasms, the causal relation ship cannot be satisfactorily explained upon any hypothesis thus far suggested.

Urinary disturbances are frequently noted during the progressive development of all varieties of ovarian neoplasms, because of interference with vesical function which the pressure effects entail.

Where complications have ensued, such as torsion of the pedicle, rupture, gangrene or malignancy, the symptoms are intensified and the diagnosis of a surgical lesion becomes readily apparent; but the exact nature of the pathology cannot even then be foretold with certainty.

Prognosis and Treatment.—One of the most serious complications to be feared is rotation of the tumor and torsion of its pedicle, with the consequent obliteration of the blood supply. This may result in infection, suppuration, and gangrene of the sac and its contents. Pyogenic infection is unlikely without marked circulatory interruption.

Rupture of the cyst has been known to occur, followed by peritonitis with fatal termination. In other instances the accident has been followed by multiple secondary peritoneal neoplastic formations; in still others the contents escaped through the vagina, the umbilicus, the rectum, or the cutaneous integument, with a resulting permanent suppurating sinus. Retention and encystment is the greatest rarity.

The larger the neoplasm the greater the clinical manifestations from pressure and interference with the functions of adjacent viscera. Small slowly developing tumors with unrestricted circulation may exist unobserved for months or years. Instances have been recorded where at operation the pedicle had disappeared, the neoplasm receiving its nourishment from omental or other visceral attachments.

The advent of pregnancy may be of serious import in the presence of any variety of ovarian tumor; but this seems especially true of the morular type because of the greater danger of rupture from pressure, and rotation with torsion of the pedicle. Williams found cysts of this type three times more frequent in pregnant than nulliparous women. Of three hundred and thirty-one cases collected by Manton ninety-two were associated with pregnancy. Samgin, on the other hand, observed but five ovarian cysts in seventeen thousand eight hundred and thirty-two labors at the Berlin Gynecological Clinic; in ten thousand eight hundred and ninety-three pregnancies at one of the largest lying-in hospitals in the world, only two morular ovarian neoplasms were encountered; a gravi duterus was discovered by Delatrez twelve times in eleven hundred and thirty-two patients with ovarian tumors; in three thousand two hundred and seventy-five öophorectomies for tumor mentioned by Olshausen three and one-half per cent were morular in type. "Most authorities agree that the presence of an ovarian tumor during gestation is one of the most serious complications, as it markedly increases the probability of abortion and frequently offers an insuperable obstacle to delivery; moreover, its presence gives rise to disturbances during the puerperium which menace the life of the mother." (Doyle.)

While all varieties of ovarian neoplasms may complicate pregnancy, the morular type seems to have been noted with the greatest frequency. In one hundred and seven cases mentioned by McKerron the type of the tumor was morular in forty-three per cent; Spencer reported forty-one cases with thirty per cent morular. In three hundred and twenty-one pregnancies with coincident ovarian tumors cited by Remy there were seventeen per cent abortions or premature labors; of seven hundred and twenty-one cases in which gestation was uninterrupted the maternal mortality was twenty-one per cent and more than one-half the children perished. (McKerron.) "The presence of the tumor seems to have no influence on menstruation or conception; a great many women go to term without knowledge of its existence, the growth of the neoplasm not being accelerated as in the case of fibroids, and abortion only taking place in the presence of complications." (Doyle.)

Halpenny recently reported the case of a woman four and a half months advanced in utero-gestation who had a violent attack of right-sided abdominal pain which persisted with occasional exacerbations for three days. She vomited and rigidity was marked over the right lower abdominal quadrant. Celiotomy revealed a gangrenous "dermoid" with twisted pedicle which had become entirely detached.

According to Lewis the frequency of ovarian neoplasms in pregnancy is one in three thousand, twenty-three per cent being morular in character. When the tumor causes disturbance from its presence during pregnancy, the most common complication is torsion of the pedicle, which occurs in eighty per cent of such cases. A larger proportion of ovarian tumors, especially the embryomata, rupture or suppurate during pregnancy than under other circumstances. In about one-third of the cases of complicating ovarian tumors more or less serious consequences ensue; in about one-fifth pregnancy is prematurely terminated.

The question of malignant transformation of morular ovarian neoplasms is one which has engaged the attention of surgeons and pathologists for many years. Like carcinoma elsewhere, no one has been able to adequately explain its mode of origin, *i. e.*, the etiology of primary carcinoma in any anatomic situation is absolutely unknown; and why a benign lesion undergoes malignant degeneration in one instance and not in ten thousand others under apparently identical circumstances, is also beyond present human understanding. No one knows the underlying cause of the mutations in cutaneous, glandular, and visceral tissues inducing the recognized proliferations which constitute malignant transformation.

While it may be true as claimed by eminent authorities that all malignant lesions have a local and benign beginning, the term "precancerous" is one of the most dangerous ever introduced into medical nomenclature. Despite the experience of the observer, he is never justified in positivly stating that any benign lesion will eventually undergo malignant transformation. Many examples might be cited in substantiation of this assertion, but such details would be inadmissible in a paper of this scope and character. It has been repeatedly stated that morular ovarian neoplasms are peculiarly prone to undergo malignant changes, but the reasons therefor have never been specifically outlined. While present knowledge may justify the assertion that in complex neoplasms, *i. e.*, those containing elements from all three germinal layers, there seems greater likelihood of carcinomatous transformation than in simple cystic or solid tumors, it is recognized this is merely stating a clinical fact without advancing the least explanatory information. The dangers attending supervention of malignant change in morular ovarian neoplasms should not be overlooked in considering the prognosis and treatment.

There is but one method worthy of consideration in the treatment of ovarian neoplasms, and that is surgical extirpation by celiotomy so soon as the neoplastic formation is recognized. Although certain gynecologists seem to believe otherwise, the abdominal route should be always employed in dealing with ovarian tumors, whether simple or complex, unilateral or bilateral. In morular neoplasms for obvious reasons puncture should be avoided if possible, and every vestige of the cyst wall must be removed to insure permanency of the operative cure. The technique of celiotomy for ovarian tumors has been perfected to such degree that there is nothing of importance to be added to what is already well known to every gynecologist of average experience.

The question of drainage after adnexal extirpation has been debated for many years, but no general rule applicable to all cases can yet be formulated. In every variety of surgical procedure much depends upon the experience and

personal equation of the individual operator. A sensible working rule is never to drain the abdominal cavity unless there exists adequate reason for so doing, and where drainage is indicated fenestrated rubber tubing should be used. Why gauze was originally advocated for the purpose of drainage is beyond understanding; it is obstructive rather than eliminative, hence defeats the object sought to be attained.

Irrigation of the abdominal cavity following celiotomy is no longer practiced unless infection has occurred, and even then the utility of the procedure is open to serious question. If irrigation seems necessary or advisable, normal saline solution should be employed for the purpose. While the intra-abdominal introduction of tincture of iodine has been strongly recommended where extensive infection has supervened, I have had no personal experience therewith. However, the most gratifying results have been reported from this method of treatment in peritonitis and infections accompanying or following traumatic injuries.

Morular ovarian neoplasms are almost invariably pediculated, and their extirpation is, therefore, attended by litle danger unless complications have already ensued when the aid of surgery is invoked; and the operative mortality should be no greater than that attending operative intervention for simple ovarian tumors. In the presence of torsion of the pedicle with gangrene, rupture, or infection, the clinical and operative dangers are correspondingly increased.

Pregnancy is not a valid contraindication to surgical treatment when the tumor constitutes a menace to life or offers an apparently insurmountable obstacle to successful accouchement. In small tumors situated high in the pelvis, operation may sometimes be safely postponed until after the patient has convalesced following delivery, always remembering that the presence of an ovarian tumor constitutes a distinct menace to the life of the individual.

Case Report: Mrs. B., aged thirty, married nine years, the mother of one child now eight years old, first consulted me about four months ago. There was nothing worthy of note in her personal or family history. She stated that her health had always been good until the birth of her child eight years before, since which time she had suffered more or less from dysmenorrhea. There had been no subsequent pregnancy, although she was anxious to have another child.

This patient came to me complaining of pain in the lower right abdominal quadrant, more or less continuous metrorrhagia, progressive loss of flesh and strength, slight dysuria and pollakiuria. Her urine was examined upon several occasions, and excepting a trace of albumin and an increase in the leucocytic content, no abnormalities were noted. Her temperature was 99° F., pulse 80, and she did not appear to be seriously ill.

Physical examination by the bimanual method revealed a pelvic tumor aparently the size of a small orange, which was slightly more prominent upon the right side. There was considerable tenderness over the lower right quadrant, and for that reason my examination without a general anesthetic was not entirely satisfactory. The enlargement seemed to be connected with the uterus, and the continuous hemorrhage caused me to suspect an intra-uterine tumor, most likely a polyp of fibroma. With this tentative diagnosis an anesthetic was administered and curettment performed, but the intra-uterine surfaces were normal. With the abdominal muscles relaxed under anesthesia no especial difficulty was experienced in demonstrating that the tumor was of ovarian and not uterine origin, and the diagnosis was accordingly changed to right ovarian cyst.

Celiotomy by median incision was immediately performed, and the tumor was removed without untoward incident, the abdomen being closed in the usual manner without drainage. Convalescence was uninterrupted, the patient leaving the hospital fifteen days after the operation. There has been no further pain or metrorrhagia, and the woman has regained her former weight and strength.

The symptoms in this case were clearly attributable to the mechanical effects of the tumor; it was deeply situated in the pelvis, and considerably larger than anticipated at the time of my examination. The uterus was displaced toward the left side, and pressure upon the urinary bladder had interfered with the function of that viscus.

Examination shows the neoplasm to be typically morular in type, containing all the histologic elements usually noted, viz., cutaneous integument, sebaceous material, one large and three smaller tufts of hair, five imperfectly formed teeth, and a few irregular osseous fragments. The tumor is ovoid in shape and measures two and a half by three and a half inches in its largest diameters.

(To be continued.)

War and Laughter

"Laugh and help win the war," said one optimist. When laughter is not silliness, when it is genuine merriment, over-riding difficulties and dangers, when it manifests courage and a mental attitude of confidence that would simply find relaxation, then is the injunction worthy of every man's attention. The value of a wholesome laugh in terms of health is undoubted."—*The Social Hygiene Bulletin.*

RESULTS OF THE CARREL-DAKIN METHOD OF WOUND TREATMENT AT THE FRENCH FRONT*

DR. A. H. EBELING
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This method of the treatment of infected wounds has been developed in the course of two years by direct experiments on the wounded. Researches were conducted in the laboratories of the temporary hospital No. 21, at Compiegne, which was largely aided in its work by the Rockefeller Foundation. The following doctors have been associated with Dr. Carrel in his work: Surgeons Dehelly, Guillot and Woimant; the chemical work was done by Dr. Dakin and Dr. Daufresne. Captain Lecomte du Nouy made the mathematical and physical researches. The purpose of the method was to prevent or to stop suppuration, to sterilize the wound and close it. It is due to a combination of processes which make it possible to employ antiseptic substance under such conditions that they are entirely efficacious.

The method involves no new principles. The road was opened by Pasteur and Lister, the surgical technic used being known to every surgeon. Neither is the method characterized by the use of any new chemical substance. The antiseptic properties of hypochlorite of soda have been known for a long time. The progress is due to the systematization of these procedures in a new way. This systematization has been brought about by scientific investigation and the employment of two methods utilizing measurements. The first was the bacteriological study of the condition of the wound and the recording of these steps on a curve showing the states of the disinfection. The second was that of measuring the progress of healing by means of a precise technic based on the discovery of some of the laws of cicatrization. The method, therefore, is dependent upon the employment, rigorously controlled by the microscope, of an approved agent, under conditions of contact, concentration and duration, established by direct experiments upon infected wounds.

The antiseptic chosen is the Dakin solution of hypochlorite of soda, neutral to powdered phenolphthalein. Dr. Carrel gave the name of Dakin's Solution to sodium hypochlorite, deprived of the alkalinity, in order to distinguish it from Labarraque's solution, which contains a great deal of alkali. Its advantages are: its high bactericidal power; its dissolving action on necrotic tissues; and the ease and cheapness of its preparation. The concentration has been empirically placed between 0.4 and 0.5%. If the percentage of sodium hypochlorite is less than 0.4%, the antiseptic power of the solution is too low; if greater than 0.5% the solution is irritating.

The action of Dakin's solution: on bacteria and tissues was studied by the comparison of the curve of *sterilization* and of *cicatrization*. These experiments showed that sterilization was obtained without any destructive action upon the *living* tissues.

The action of *Hypochlorite* in solution on an infected wound comprises two processes.

1. *Chemical reaction;* bacteria as well as other organic material in wounds, necrotic tissue, blood clots, are dissolved—chlorine-nitrogen compounds are formed of the nature of chloramines.

2. *Antiseptic action;* not only of the hypochlorite itself, but also of the chloramine compounds so formed.

It is important to emphasize the following facts: The Hypochlorite solution *will dissolve necrotic tissue and blood clots*. Chloramine T and dichloramine T in oil have *not the power to dissolve* necrotic tissue and blood clots.

Dakin's solution may be satisfactorily prepared in any one of several ways. *First,* by double decomposition of calcium hypochloride and sodium carbonate. This method, the one first used by Dakin, has been, because of the ease of obtaining the necessary chemicals, the most available one. The alkalinity of the solution, after the precipitation of the calcium carbonate is neutralized by the use of a mixture of sodium carbonate and sodium bicarbonate in the precipitation. In either case, it is necessary to determine the percentage of available chlorine in the bleaching powder with which one is working. *Second,* by the electrolysis of a sodium chloride solution, this method gives the product a non-irritating quality, but requires apparatus and electric current which are not always available. A third very simple method has been developed here by the action of liquid chlorine on sodium carbonate.

The most efficient action of an antiseptic is obtained only when it enters into *intimate* contact with the bacteria causing infection. Therefore surgical and mechanical cleansing is *essential.*

The soldier after being wounded is a man in a state of incubation—inoculated with bacteria. The substance of the wound is composed of blood clots, muscular debris, undergoing autolysis, forming a splendid culture medium. To alter these ideal conditions for the development of bacteria is of prime importance. The wound must be widely opened and maintained open. No call for hesitation in making

* Read before the New York and New England Association of Railway Surgeons, November 8th, 1918.

very free incisions exists. War wounds are more extensive than they appear. Under a small skin wound there may lie a large bruised, necrotic and destroyed area of muscle tissue, infiltrated subcutaneous tissue, blood clots, missiles, and above all shreds of clothing which carry and disseminate the dangerous gas producing organism (spores of Welsh bacilli).

No modification or change can be made in either the solution itself nor in the processes for the mechanical and chemical treatment. Both mechanical and chemical treatment are important. If the surgical work has been inefficient, no method will give the sterilization necessary for tissue regeneration.

TREATMENT OF FRACTURES*

J. SHERMAN WIGHT, M.D.
BROOKLYN, N. Y.

I desire to emphasize the difficulty that the surgeon finds in deciding if a hip has been injured. If he sees the case soon after the accident and obtains an *x*-ray, a fracture may be distinguished from a number of other conditions which, however, bear a strong resemblance to an impacted or united cervical fracture.

In children—An epiphyseal separation resembles depression of the neck in coxa vara. Both give discomfort, limp, limitation of motion, shortening, atrophy, and a prominent trochanter. Tuberculous disease is a chronic process and may be aggravated by an injury therefore should be seen early. Osteomyelitis is usually acute, but if chronic the joint is ankylosed.

In adults—I will refer to fracture of the femoral neck, coxa vara, arthritis deformans, tumor or malignancy of bone, and osteomyelitis. A bone with malignant disease breaks spontaneously or with very little violence. This would be disclosed with *x*-rays. Osteomyelitis would be recognized with *x*-rays. On the other hand, the symptoms of the other conditions as well as the *x*-ray pictures would be very much alike if the case was seen a long time after the injury, therefore, the surgeon must be very alert to discover the old history no matter how carefully it is guarded.

A fracture of the neck of the femur is the most disabling of all fractures. We do not distinguish its relation to the capsule. The object of treatment is to obtain a functionally useful leg. Buck's extension and the long side splint give very poor results. Whitman's abduction method is better. The best results are obtained with the bone peg and abduction in plaster. It is indicated in all operable, unimpacted fresh fractures in patients up to fifty years of age and in operable ununited fractures.

Before the surgeon gets to the treatment of these fractures he has a good many difficulties to overcome. I want to say a few words about the diagnosis of fractures.

Now I would like to say just a few words about the treatment of fracture at the neck of the femur. I understand that there is one method of treatment, for this one has been so far standardized, that there is no question as to what the procedure should be if one has made the diagnosis. The long side splint of course gives very poor results and the result of fracture of the femur is an impairment of the functions, which is very serious, and we must do something to repair the broken bone.

Whitman's method undoubtedly gives very satisfactory results, but not in all cases; but I have never been able to put the limb in position without using the fracture table, any more than I have been able to repair the broken bones without the use of a fracture table to fix the fragments after reduction until the case has been put on, even though I have united the bone with some form of uniting material, suture, or whatever it may be. In my experience in operable cases, bone-peg is the best method of repairing a fractured neck of the femur; it doesn't make any difference whether it is a child or an adult. In order to get the best results one must use the fracture table and fix the fragments during the time that one places the bone in position and during the time of the plaster cast with abduction to secure it and maintain it in position.

Now, as to the method of treating fractures in general, if I may digress a little, I would like to say that I have done away with the bone plate. I do not use the bone plating any more or silver wire. Both of them are foreign bodies and cause considerable irritation and they should be removed after the cementing of the fragments; in place of them I use, almost altogether, a bone suture; in children, always chromic gut and, in adults, kangaroo tendon. After having fixed the fragments on a fracture table and securing them with the suture and apply the plaster cast so that I have no difficulty about it slipping. Of course, if there is going to be non-union, that is a different matter, but in cases where it proceeds to unite, I find that is the best method. However, I will say in long spiral fractures I have to use the bone screw, but that can be removed and is never left in position.

* Read before the New York and New England Association of Railway Surgeons, November 8th, 1918.

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WALTER M. BRICKNER, M.D., F.A.C.S., Editor

NEW YORK, MAY, 1918.

THE RESTORATION AND REPAIR OF THE WOUND, COMBATING CONTAMINATION AND INFECTION.

It seems curious that the paramount feature of this war's surgical investigations should be a harking back to first principles, namely, the treatment of wounds. One would suppose that, after half a century of Listerian methods, a period in which the use and development of surgery had reached an amazing fruition, that the treatment of a simple wound would be so firmly established as to be beyond controversy. The only surgical discoveries of any importance, that this was has brought forth, have been in the domain of what may correctly be considered elemental surgery. Indeed, those who have tried to keep in touch with surgical progress have been bewildered by the number of new methods that have been introduced for the treatment of wounds. All, or nearly all, have been acclaimed by their advocates as methods of choice; strangely enough, the compensating leaven of criticism has been wofully lacking. We have long felt the pressing need, therefore, of a discerning critique of these methods from an *ex cathedra* source, and by one whose reputation and war experience are such as to command respect. Such a critique we now find in a short but admirably written paper by Crile (The Restoration and Repair of the Wound, Combating Contamination, *Surgery Gynecology and Obstetrics,* April, 1918).

Crile divides the repair of the wound into four stages: 1. The stage of depressed local resistance, *i. e.,* the first twelve hours. 2. The stage of infection. 3. The stage of granulation and healing. 4. The superficial healing; end-defects, sinuses, etc. Obviously the most important stage is the first. Here the indications are two: 1, restoration of depressed local resistance; 2, destruction of contaminating bacteria. Depressed local resistance is a factor which surgeons, as a class, have not hitherto appreciated, for the reason, probably, that few surgeons have had the opportunity to study traumatized wounds in such masses as have occurred during this war. One of the first lessons that surgeons abroad have learned is that devitalization of tissue contributes largely to delayed healing of the wound, because the tissues expend unnecessary energy in getting rid of such tissues. Crile, therefore, recommends that all devitalized tissue must be removed at once. This must be done lightly and sharply. At the same time the wound must not be handled roughly by sharp retractors, by grinding tissues between sharp edges of bone, etc. As Crile militaristically puts it, "With the aid of damaging inhalation anesthesia, the rough surgeon does slowly and awkwardly what shrapnel does painlessly and quickly—the shrapnel injury is to be preferred."

Next in importance to "excision revision" is the application of the principle of physiological rest. This means not only the gross rest obtained by supports and bandages, but even the finer cellular rest obtained by avoiding tight sutures and bandages, the prevention of an accumulation of discharges in the wound, the avoidance of all pain in dressings and the elimination of damaging antiseptics.

Crile's comment on the use and value of antiseptics is illuminating. He predicates his discussion by the postulate that the best antiseptic is the bactericidal power of the tissues. This is another reason why the tissues must be kept at their highest point of activity, by not permitting anything to devitalize them. As for chemical antiseptics, Crile rightly insists that none can command good results with bad surgery. Unfortunately in the rush of battle, good surgery cannot always be commanded, so that chemical antiseptics must be depended upon. "Again, if a wound has become infected in the midst of good surgical opportunity, antiseptics may be required." If the wounds are deep and extensive and facilities are excellent, the Carrel-Dakin is the method of choice. If, however, there is a rush of cases, B. I. P. (Bismuth 25. Iodoform 50. Paraffin 25.) is an excellent dressing; a good B. I. P. dressing is better than defective Carrel-Dakin treatment.

Many wounds do well with Eusol, and many travel well with a Wright (hypertonic salt solution) pack.

In the stage of infection, the treatment consists in physiological rest and incision and drainage. In addition, heat, preferably in the form of moist heat, is indicated, with elevation of the wounded member. If good surgical facilities are not available, B. I. P. dressings are again preferable to Carrel-Dakin. Especially to be avoided during the stage of acute infection are, pain, lipoid solvent antiseptics and rough handling. As Crile again forcibly states it: "If one were endeavoring to produce septicemia experimentally, one of the best methods would be to first 'gas' the phagocytes with chloroform or ether; and then 'bonejah' through the established line of defense."

In his paper, Crile shows that the treatment of a wound is not a simple matter, and that the surgeon must always adapt his methods to the nature of the wound and the exigency of the situation. Certainly, these observations emphasize a view that we have always held; namely, that the test of a surgeon does not consist in his ability to execute a difficult operation, but in watching him dress or even direct the dressing of the ordinary open wound.—E. M.

THE VALUE OF THE PRIMARY SURGICAL AID IN WAR INJURIES.

The dominant lesson, which the present war has so thoroughly taught, is that the terminal result after any injury, which does not kill immediately or within a few hours, depends with almost mathematical precision upon the celerity with which medical assistance is given and upon the character and efficiency of the surgical first aid which is rendered. The hitherto prevailing opinion has undergone a complete revolution, and the watchful waiting of the Boer and other wars has been discarded and replaced by an intelligent aggressiveness which realizes that in desperate conditions active measures are essential. Happily this policy has been abundantly justified by superior results.

No new principle has appeared. Methods which are in ordinary usage in civil life have been applied and have been followed by approximately similar successes. Abdominal injuries, especially, have been benefited by this new policy of utilizing the most expert surgical skill at the earliest possible moment after the reception of the injury. Under such conditions, also, it has been found that the sequence of events in military injuries has paralleled that frequently seen in civil life.

It has proved singularly fortunate for the wounded of the present war, that the exigencies of military activity have not demanded rapid and repeated changes of position. The line of battle, except for some slight variations, remains more or less fixed; and the methods applicable in a fixed community have been found possible of accomplishment. Units have been gathered especially fitted by training, and frequently composed of men accustomed to work together, the total result marked by skillful efficiency. These have been sent to within a short distance of the firing line (one or two hours by motor transport); and the first aid has lost its former meaning and has acquired a thoroughness which has been followed by results which leave little to be desired.—A. O. W.

AN IMPERATIVE APPEAL FOR MEDICAL OFFICERS.

An urgent and imperative appeal has just been issued by the Surgeon General of the United States Army, for doctors for the Medical Reserve Corps.

There are to-day 15,174 officers of the Medical Reserve Corps on active duty and the Medical Department has reached the limit of medical officers at the present time available for assignment. With these facts before the medical profession of this country, we believe that every doctor who is physically qualified for service between the age of 21 and 55 years, will come forward now and apply for a commission in the Medical Reserve Corps.

The Surgeon General says: "So far the United States has been involved only in the preparatory phase of this war. We are now about to enter upon the active or fighting phase, which will make enormous demands upon the resources of the country." The conservation of these resources, especially that of man-power, depends entirely upon an adequate medical service.

Drafts of men will continually follow drafts, each of which will require its proportionate number of medical officers, and there are at this time on the available list of the Medical Reserve Corps an insufficient number to meet the demands of these drafts.

The real necessity for the complete mobilization of the entire profession is imperative. It is not a question of a few hundred men volunteering for service, but of the mobilization of the profession for the conservation of the resources of this country. Let every doctor who reads this editorial and appeal from the Surgeon General, which appeal is based upon dire necessity, act promptly and present his application for a commission in the Medical Reserve Corps at the nearest Medical Examining Board. If you are not informed of the location of your Board, the Editor of this journal will advise you.—MACD.

Surgical Sociology

Ira S. Wile, M.D., Department Editor.

THE RECONSTRUCTION AND REHABILITATION OF SOLDIERS.

The problem of the rehabilitation of graduates from the school of war experience will depend in no small measure upon the physical reconstruction of those who have suffered from diseases and wounds. The experience in all sections of the world indicates the problem of preparing wounded soldiers for re-entrance into civil and industrial life as a matter of the utmost importance.

In the past, hospitals have been satisfied to perform their amputations and issue a discharge card after the wound has healed. The single instances of maiming did not attract our attention. When, however, thousands of men will present some form of injury interfering with functional power, the government interest does not cease with the complete repair of the wound, but carries over until the deformity is concealed or the disability is overcome to the greatest possible extent. The old idea of the cure and relief of an injury is being transformed into the clear and more rational thought, the cure and relief of the man. In the English experience, according to F. D. Patterson (*Medicine and Surgery,* February, 1918), "over 1,000 men returned as unfit for further service, 453 are rendered so by injuries and 547 by diseases. Thirty-two in the thousand have wholly or partially lost their sight, 49 have lost an arm or leg, 264 have had serious injuries to their limbs or to the hand, about 60 have suffered miscellaneous hurts. Of the diseased, the largest total, 124, is accounted for by ailments of the chest, about half being tuberculous; the second largest, 110, by diseases of the heart; the third, 67, by what may be called nervous troubles, of which 11 are cases of epilepsy and 9 of insanity." According to the *Lancet* of July 21, 1917, the present number of war cripples in England is in excess of 200,000.

It is patent that the surgical and educational resources of our country are to undergo a new test. The problems of industrial accidents and diseases have been regarded mainly as solved by the provision of adequate systems of compensation or insurance, with comparatively little stress being placed upon the reconstruction or rehabilitation of the suffering individual. If men are to have their economic value lowered by service in behalf of their country, there is a heightened responsibility of the nation to return them to their families and to the community in the best possible condition to take up their burdens on a basis of self-support and comparative independence of the assistance, ordinarily termed charitable.

The federal disability compensation will be exceedingly helpful, while the Workmen's Compensation Laws will undoubtedly be amended so as to deal justly with those who will come under its provisions in a condition far from normal. The main steps to be taken, however, will require the most skillful form of medical and surgical treatment, guidance in the choice of a future occupation, together with adequate technical training to fit for it, the establishment of employment exchanges that will secure positions, and the maintenance of medical supervision for a sufficiently long period to determine that the occupation is not acting unfavorably upon the health or welfare of the reconstructed man.

Under the circumstances, every hospital must have its social vision enlarged so that it may see the importance of protecting, not merely those who are injured in warfare, but the 300,000 human beings who each year suffer serious industrial accidents. Pain and suffering incident to injury are of minor consequence compared with the anxiety, depression, and wastage which result from failure to reconstruct, physically and mentally, those who have been penalized through the shortcomings of our industrial organization.

A new era is at hand which will recognize that the crushing of a finger carries with it a greater loss to society than the removal of an appendix, and that the loss of an eye is a more serious handicap than the removal of a gall-bladder. From the standpoint of social stability, a large proportion of our so-called major operations are minor in effect, while the minor injuries of the past take on a new significance because of their serious effects upon the human resources of the country.

THE GREATER WAR.

In the various nations engaged in this war, in times of peace, over 6,500,000 die annually from preventable diseases. There have been fewer than 7,000,000 killed in action on all sides since the outbreak of war. Obviously, then, all the battles in the interest of humanity and the interests of nations are not fought in the firing line. The perennial warfare waged against the invisible foe is as important—if not more so—than that now waged against those who are threatening the destruction of the very principles of civilization.—CHAS. J. HASTINGS, M.D., in *The Toronto Bulletin.*

Book Reviews

Military Surgery. DUNLAP PEARCE PENHALLOW, S.B., M.D. (Harv.), Major Medical Reserve Corps, United States Army; Chief Surgeon American Women's War Hospital, Paignton, England; Formerly Director of Unit, American Red Cross European Relief Expedition. With Introduction by SIR ALFRED KEOGH, K. C. B., Director-General Army Medical Service. Original Drawings by the Author. *Second Edition.* London: Henry Frowde, Hodder & Stoughton. OXFORD UNIVERSITY PRESS, Warwick Square, E. C., 1918.

The rapid deevlopment of experience in the treatment of wounds, due to war injuries, makes it difficult for the published literature to keep pace with the most modern thought. It is only a few months since Penhallow's most excellent book was presented to the medical profession and already his second edition is required for the further consideration of numerous theories which, seemingly were valuable but now appear to be of less importance. The great advance in the treatment of infected wounds by the technic established by Carrel, is given thoughtful consideration in the revised edition, and in consequence, the chapter devoted to Treatment of Wounds has been thoroughly revised, in view of the more recent experiences with Dakin's Solution and the Carrel Tubes. The illustrative material has been considerably enriched and the subject matter expanded about one-third.

In every way, the second edition has enhanced value for the student or practitioner of surgery, whether his work is in civil or miltary fields.

A Practical Text-Book of Infection, Immunity and Specific Therapy: With Special Reference to Immunologic Technic. JOHN A. KOLMER, M.D., DR. P. H., M. Sc. Assistant Professor of Experimental Pathology, University of Pennsylvania; Professor of Pathology and Bacteriology, Philadelphia Polyclinic, and Pathologist to the Department of Dermatologic Research; Pathologist to the Philadelphia Hospital for Contagious Diseases. With *An Introduction* by ALLEN J. SMITH, M.D., Sc.D., LL.D. Professor of Pathology, University of Pennsylvania. With 147 Original Illustrations, 46 in Colors, by Erwin F. Faber. Instructor of Medical Drawing, University of Pennsylvania. *Second Edition,* Thoroughly Revised. W. B. SAUNDERS COMPANY, Philadelphia and London, 1917.

The success of the first edition of Kolmer's work, and the rapid advancements made in the branches of medicine which it covers are adequate reasons for the publication of the second edition. There is no alteration in the general plan of the work, but various additions and modifications have been made in order to bring up to date the information provided upon various topics, such as Focal Infection, The Schick Toxin Test for Immunity in Diphtheria, Complement Fixation in Tuberculosis and Other Bacterial Infections. The chapter dealing with Bacterial Vaccines has been amplified and improved, although in some instances there is not an equality of discussion in the revision. The discussions on the treatment of Poliomyelitis with serums is adequate, though, of course, it is impossible to place in a book everything that might be desired and still retain the pages within a reasonable number.

Particular attention is merited by the chapter on Chemotherapy, in which there is a discussion upon the toxicity of Salvarsan and its congeners.

The section on Experimental Infection and Immunity is again included, and it is to be hoped that it always will be included in future editions as it is a most valuable adjunct for students of the subject and of no uncertain assistance to those who play the rôle of teachers.

In short, the second edition continues to support the claims of those who deem this volume the most complete, comprehensive and elucidating treatise upon Infection, Immunity, and Specific Therapy.

In most books, the appendix represents an after-thought, not essential to the understanding of the body of the book, but Ford has made the appendix one of the most useful sections in that he has presented a large series of blanks and forms filled out for explanatory purposes and has related them to the regulations or general orders authorizing them. Almost 200 pages are devoted to the tabulation of forms and methods as demanded in following out the instructions of the War Department, The Medical Department, and various other sources of regulations and instructions.

The authoritativeness of this book is vouched for by the introduction which is merely a recommendation by the Surgeon General of the Army ending with these words: "I hope every medical officer in our service will furnish the men with a copy." To this hope of the Surgeon General there may be added the statement that those who are not in the army service, but who desire to have an intelligent conception of the duties and responsibilities of the medical service in the Army should familiarize themselves with this meritorious compendium, the presentation of which at the preesnt time is most beneficial, and should lead to greater efficiency of the Medical Corps.

Details of Military Medical Administration. JOSEPH H. FORD, B.S., A.M., M.D., Colonel, Medical Corps, U. S. Army. With 30 Illustrations. Philadelphia: P. BLAKISTON'S SONS & Co. Octavo, 733 Pages. Price. $5.00.

The difficulties of acquiring the requisite knowledge for military administration by medical men are lightened through the publication of this excellent volume by Ford. In many ways the book represents a compilation of practical facts and authoritative regulations which could only be secured under ordinary circumstances through the reading and studying of a large number of official publications of the Army, Navy, and Public Health Service. The data officially promulgated are reinforced and supplemented by many notes from published articles or unpublished memoranda, made by men thoroughly competent to have opinions and judgments by reason of practical experience in administrative work.

It is difficult to point out specific chapters of paramount importance because each one so thoroughly presents the subject matter that it is designed to present for the information of the medical officer. Among the chapter probably most useful to the newly appointed medical officer are those describing the duties and responsibilities of the Regimental Surgeon and Post Surgeon, and the ones relating to the Examination of Recruits and Malingering. Every chapter, however, is explicit, thorough, and useful, and must necessarily be of pronounced assistance to the man who, having left civil life, is taking up the work of a Medical Military Administrator.

Blood Transfusion, Hemorrhage and the Anemias. By BERTRAM M. BERNHEIM, A.B., M.D., F.A.C.S., Instructor in Clinical Surgery, The Johns Hopkins. University; Captain, Medical Officers Reserve Corps, U.S.A.; Author of the "Vascular System," etc. Octavo; 259 pages; 18 illustrations. Philadelphia and London: J. B. LIPPINCOTT COMPANY, 1917. $4.00.

The present volume, an outgrowth of a chapter on blood transfusion written in 1913 as part of a monograph on surgery of the vascular system, introduces the subject to us with a short historical sketch. Following this there is a compilation of the facts known concerning the physiology of the blood; and special attention is paid to the phenomena of bleeding, its control and the factors involved in determining the danger limits of hemorrhage. The subject of transfusion occupies the bulk of the book: chapters are devoted to indications, to the dangers accompanying or following this procedure—to be avoided by proper testing of donor and recipient,—and rather full descriptions are given of the various methods by which blood can be transfused.

A number of conditions—acute hemorrhage, the anemias, hemophilia, purpura, jaundice and leukemia—receive special attention: in the therapy of these diseases transfusion finds its chief place.

Some of the methods of transfusion, which are de-

scribed, should be mentioned only to be rejected. At the present writing, two methods have been standardized: that for the transfusion of unadulterated blood (Lindeman, Unger); that for blood mixed with an anticoagulant (Hustin, Weill, Lewisohn). These have assumed dominant positions and their continued efficacy promises that future modifications will be trivial. Perhaps of these the citrate method will prove the most elastic, the most widely applicable in regions devoid of hospital facilities, the most simple for the tyro; and it may well be that this method will finally prevail.

These considerations are put aside by Bernheim as relatively unimportant and he indicates strongly that the time has come to make accurate studies of the indications for transfusion; of the dosage to be employed, of the happy moment for the exhibition of this therapeutic measure which will ensure the maximum beneficial effect. Heretofore transfusion has been practiced in many cases in which it has been of dubious value. With increased knowledge, these false indications have been eliminated and the therapeutic use of blood transfusion is being put on a sound basis.

One is keenly disappointed in not finding a chapter, devoted to transfusion in military surgery, in this otherwise excellent monograph.

Military Ophthalmic Surgery. ALLEN GREENWOOD, M.D., Major, M.R.C., U. S. A. Recently Honorary Lieut.-Colonel, Harvard Surgical Unit with the Royal Army Medical Corps, British Expeditionary Force. Including a chapter on *Trachoma and other Contagious Conjunctival Diseases*, by G. E. DESCHWEINITZ, M.D., Major M.R.C., U.S.A., and a chapter on *Ocular Malingering*, by WALTER R. PARKER, M.D., Major M.R.C., U.S.A. Illustrated. Philadelphia and New York: LEA & FEBIGER. $1.50.

As the name implies, this is a manual for the use of medical officers, especially those near the first line stations, who are brought in contact with eye injuries. The main thought of the book seems to be to direct such early and emergent treatment as will preserve the injured eyes for future plastic and reconstructive work and enable the wounded soldier to get the best uses of his eyes after being brought to the hands of the ophthalmologic surgeon at the base hospital. To pursue this object most effectually the author suggests the establishment of separate hospitals to which this class of injuries can be removed rather than an ophthalmic division at several hospitals where the number of cases is smaller and the facilities for handling them inadequate. The methods employed have all been tried out in the British Army hospitals and their value proven.

An interesting and very instructive chapter on trachoma, by Dr. De Schweinitz, is included. The differential diagnostic points between this disease and other forms of conjunctivities are described in some detail as well as the better methods of treatment. This section of the book is one that would appeal to every practitioner in civil life as well as to those in the service.

There is also included a chapter on malingering by Dr. Parker.

International Clinics. A quarterly of illustrated lectures and especially prepared original articles by leading members of the medical profession throughout the world. Edited by H. R. M. LANDIS, M.D., *Volume 4*, Twenty-seventh series, 1917. Philadelphia and London: J. B. LIPPINCOTT COMPANY.

Volume 4 contains a large number of clinical reports and articles which have a very general interest. There are some very timely articles dealing with military topics, of which the clinics of Dr. Albee and the paper of Dr. Froger are deserving of especial mention. These are all well and lucidly written and are illustrated with numerous and appropriate drawings and photographs.

A communication of Dr. William A. Steel deals with the treatment of pyemia and septicemia by transfusion of immunized blood. The conclusions are worth quoting:

1. Transfusion of blood from self-cured cases has a curative action on patients suffering from chronic septicemia or pyemia.

2. The infection from which the donor has recovered should correspond clinically and bacteriologically to the infection by which the recipient is being overcome.

3. The transfused blood is used up in about five days, and a second dose should be given at that time and repeated as often as the clinical symptoms warrant.

4. The immediate improvement is so marked that one gets a false sense of security, which will be shattered by a relapse if repeated transfusions are not persisted in.

5. It offers a promising method of cure in the usually fatal chronic septicemia and pyemia conditions.

Books Received

Evolution ve la Pl Aie de Guerre. PAR A. POLICARD. Precis De Medecine & De Chirurgie De Guerre. MASSON & CIE EDITEURS. 1918.

Premieres Heures du Blesse de Guerre. PAR P. BERTEIN ET A. NIMIER. Preface Du Medecine Inspecteur General Jacob. Precis de Medicine & De Chirurgie de Guerre. MASSON & CIE EDITEURS. 1918.

Les Blessures du Cerveau. PAR CHARLES CHATELIN. Preface Du Pierre-Marie Deuxieme Edition. Precis de Medecine & de Chirurgie. MASSON & CIE EDITEURS. 1918.

The Surgical Clinics of Chicago. February, 1918. Volume 2—Number 1. With 73 illustrations. Published Bi-Monthly. W. B. SAUNDERS COMPANY, Philadelphia & London.

Progressive Medicine. A Quarterly Digest of Advances, Discoveries and Improvements in the Medical and Surgical Sciences. Edited by HOBART AMORY HARE, M.D., Professor of Therapeutics, Materia Medica and Diagnosis in the Jefferson Medical College, Philadelphia. Assisted by LEIGHTON F. APPLEMAN, M.D., Instructor in Therapeutics, Jefferson Medical College, Philadelphia. March 1, 1918. LEA & FEBIGER, Philadelphia, New York, Six Dollars Per Annum.

Modern Urology. In Original Contributions by American Authors. Edited by HUGH CABOT, M.D., F.T.C.S., Chief of the Genito-Urinary Department of the Massachusetts General Hospital; Assistant Professor of Genito-Urinary Surgery in the Harvard Medical School, Boston, Massachusetts. VOLUME 1. General Considerations—Diseases of Penis and Urethra—Diseases of Scrotum and Testicles—Diseases of Prostate and Seminal Vesicles. Illustrated with 368 Engravings and 7 Plates. VOLUME 2. Diseases of the Bladder—Diseases of the Ureter—Diseases of the Kidney. Illustrated with 264 Engravings and 10 Plates. LEA & FEBIGER. Philadelphia & New York, 1918.

Thyroid and Thymus. ANDRE CROTTI, M.D., F.A.C.S., LL.D., formerly Professor of Clinical Surgery and Associate Professor of Anatomy at Ohio State University College of Medicine; Member of the American Medical Association, Ohio State Medical Association, Columbus Academy of Medicine, American Association of Obstetricians and Gynecologists, Society for the Study of Internal Secretions. Octavo; pages 556+10; with 96 illustrations and 33 plates in colors. Philadelphia and New York: LEA & FEBIGER, 1918. $10.00.

Sanitation for Medical Officers. EDWARD B. VEDDER, M.D., Lieut.-Col., Medical Corps, U. S. A. Illustrated; Duodecimo; 206 pages. Philadelphia and New York: LEA & FEBIGER, 1917. $1.50.

Progress in Surgery

A Résumé of Recent Literature.

Blood Pressure in Wound Conditions. JOHN FRASER and E. M. COWELL, France. *Journal of the American Medical Association,* February 23, 1918.

Fraser and Cowell report the results of their studies of blood pressure in various wound conditions. The readings were made mostly in the casualty clearing stations near the firing line, though some were made in the trenches and in the advanced dressing stations of field ambulances. The "Riva Rocci" mercury manometer was mostly used at first, but lately they have been using a spring sphygmomanometer which has the advantage that it can be used under more conditions and is generally more adaptable. In certain cases with a hardly perceptible peripheral pulse the stethoscope was employed. A number of control readings were made on healthy soldiers with a wide range of results. The systolic pressure was generally lower than one would have accepted as normal in civil practice, and they observed that among soldiers engaged in the actual fighting the average systolic pressure was higher than among the relief parties of the same regiments who were only exposed to occasional fire. They found two distinct groups of blood pressure conditions in recently wounded men. The hypertension group with systolic pressure varying from 150 to 160 or even 170 mm., and the hypotension group (with primary shock), with pressure varying from 40 to 90 mm. In the first group the pressure gradually falls and in the case of a normal recovery, with rest in bed, remains at a steady level between 110 and 120 mm. In the second group the patients are cold, often pulseless, and the anatomic lesion seems sometimes to be entirely out of proportion to the physiologic reaction. If hemorrhage occurs secondary shock develops and the pressure continues to fall. Following the application of treatment, with rest and warmth, the blood pressure may become partially re-established. With head wounds without penetration of the skull there was usually a high pressure, but with penetrating wounds the writers observed that the diastolic closely corresponded to the systolic pressure with a correspondingly low pulse pressure. Perforating wounds of the skull were followed by both high and low pressures, the former when the through and through wounds involved the ventricles and were accompanied by hemorrhage into the cavities of the ventricles. The low pressure cases were obserevd with more or less superficial wounds of the brain, especially in the frontal and occipital regions. The blood pressure subsequent to wounds of the head is apt to be unstable and if operation is performed before it becomes stable disaster is liable to ensue. A summary is given of the abdominal wounds observed and they find that in patients seen within six hours of being wounded, if there is an intraperitional injury of a hollow viscus, the blood pressure is low. When about ten hours have elapsed and the primary shock has passed off it rises, to fall again later with a shock-like condition due to sepsis and loss of blood. Wounds of solid viscera of moderate severity appear to be associated with a relatively high blood pressure. Perforating wounds of the viscera which do not open into the peritoneal cavity are associated with practically normal blood pressure. Large wounds of the parietes are generally associated with a lower blood pressure than smaller wounds. Opening the abdomen and setting free a large amount of blood caused rapid fall of pressure, but if the abdominal cavity did not contain much blood the opening was followed by a temporary rise followed by a fall in a few minutes. Large open chest wounds with entrance and exit of air show profound drop of pressure, while those of uncomplicated closed wounds show normal pressure. When severe internal hemorrhage has occurred and the patient has been exposed to cold or has been infected hypotension is present and progressive. Compound fractures of the lower extremities are generally associated with a fall of pressure when seen in the casualty clearing stations. The blood pressure varies with the amount of hemorrhage, and the compound fractures of the upper extremities closely follow the same rule. Face wounds seldom affected the blood pressure unless compound fracture of the face bones had occurred. Multiple wounds of the body and extremities generally lowered the blood pressure. The effects of various transfusions were noted. The authors were disappointed with their results from the use of physiologic sodium chloride. More satisfactory findings followed the use of Ringer's solution and its modifications. The use of colloidal solutions causes a rise almost invariably within a few minutes. They have had no experience with glucose solutions. Excellent results followed direct blood transfusion in cases of profound shock with hemorrhage, an injection of the calcium hypertonic gum solution causes an immediate rise of pressure in cases complicated by toxemia which may tide the patient through an operation. In milder cases of shock and hemorrhage an infusion with hypertonic saline is useful. A number of pressure charts showing the behavior of the tension during convalescence were obtained. An uncomplicated wound maintaining steady pressure was found favorable, and a steadily rising or maintained high pressure reading may be taken as a favorable prognostic sign. Eight charts and five tables accompany the article.

The Initiation of Wound Shock. E. M. COWELL, France. *Journal of the American Medical Association,* March 2, 1918.

First defining the terms primary wound shock and secondary wound shock, the first ensuing within twenty minutes or more after receiving the wound and the second following exposure in a long carry in the cold or the onset of toxemia or the presence of continuous slight hemorrhage, Cowell describes his method of obtaining the later phases of fully developed wound shock at a series of temporary posts along the line of the carry, each equipped with an observer and instruments to make clinical observations and test the blood pressure at short intervals. A good deal of light is shed on the pathogenesis of wound shock by a consideration of the conditions of life of a soldier on the firing line. In areas behind the trenches the conditions are practically normal. The average systolic pressure of an unwounded man is from 110 to 120 mm. with a diastolic of from 57 to 80 mm. and a pulse pressure of from 35 to 40 mm. In the front line trenches, however, the conditions of existence are for the most part unfavorable. The soldier is subjected to long spells of hard physical labor, often accompanied by profuse sweating, short and usually interrupted sleep, and only a scanty supply of water, and in the firing line and during battle these conditions are accentuated. For a large part of the year exposure to wet and cold are to be reckoned with. Thus the man, who may be hit at any time, is likely to be in a state of fatigue, with a tendency to concentration of plasma, sluggish peripheral circulation and accumulation of waste products of muscular metabolism. The urine of such men is dark, scanty, and loaded with phosphates. Observations have shown that the blood pressure in such cases is a little above normal, and rises still higher with increased activity. Similar observations could not be made in the heat of battle, but there is no doubt that these physiologic conditions were all present, only in a much greater degree, affording important pre-wound factors in the initiation of wound shock. Shock following trivial wounds, which cause only slight damage to the tissues, that following moderately severe injuries, and that following serious wounds are considered separately by Cowell. As regards the first mentioned, he refers to the psychic factor and the increased suprarenal activity. The circulation is better maintained by the raised blood pressure in most cases. In the excitement cases, the pressure subsides rapidly with quiet and rest. In moderately severe wounds primary wound shock does not occur within a few minutes, and if proper care can be given, secondary shock may be averted. As the factors of cold, toxemia, pain, anxiety or lack of water are allowed to come into play secondary wound shock develops within a few hours. In some of the severely wounded cases and the unavoidably fatal ones, symptoms develop immediately, and hypotension is found from the beginning. This is primary wound shock, which unless recovery first occurs merges into secondary wound shock. In the slighter cases recovery from primary symptoms is rapid, but then exposure and other factors may come into play and secondary wound shock may become established.

A Study of Anteoperative and Postoperative Blood Counts in Non-infective Surgical Conditions. FRANK L. MELENEY. *Annals of Surgery,* February, 1918.

In surgical cases undergoing operation without infection the white cells increase in number, and about six hours after operation have more than doubled. The response is due almost entirely to an increase in the number of the polymorphonuclear cells. There is a trivial rise in the number of red cells after operation, but in the subsequent ten days this is followed by a progressive anemia, with an average loss of about one-half million cells.

The white cell count may be expected to fall rapidly in clean cases and reach normal on the fourth day. In infected or contaminated cases it will fall much more slowly. The latter, however, have no influence on the initial rise. The height of the blood count depends on the severity of the trauma, the number of sutures and ligatures, the loss of blood and the duration of anæsthesia. Normal subjects induce higher counts than abnormal types.

Observations on War Wounds of the Knee-Joint Among French Soldiers. J. R. JUDD. *Surgery, Gynecology and Obstetrics,* February, 1918.

Wounds of the knee-joint in modern warfare maintain the same importance and gravity that have existed since the birth of surgery. The resisting powers of the synovia and their ankylosing tendencies vary in individuals.

In the presence of an infected projectile and infected joint fluid, the synovia may remain uninfected for a brief period. Fissures extending to the articular surface are important and are often unrecognized. Secondary infection of the ankle-joint sometimes occurs unexpectedly and is a grave complication.

The earlier methods of non-interference, drainage tubes, and wholesale removal of bone were accompanied with disastrous results. The mortality has been greatly reduced by improved methods of treatment. Perforating wounds traversing the joint should be treated by puncture, compression, and immobilization. For wounds with foreign bodies included, with or without bony lesions, early intervention is the secret of success.

The new era in joint-surgery calls for arthrotomy within forty-eight hours, the removal of the projectile, foreign bodies, and loose fragments, the excision of the path of projectile, the cleansing of the joint and suture without drainage. Extensive bony lesions demand primary resection. This modernized treatment not merely is more effective in preserving limbs and their functions, but decreases the period necessary for hospital attendance.

The General Principles of Treatment of Wounds of the Knee-Joint from Projectiles in Warfare. CHARLES GREENE CUMSTON. *Annals of Surgery,* February, 1918.

Immediate amputation is indicated: (a) when there is extensive destruction of tissue; (b) when the popliteal vessels are badly torn; (c) when the leg is gangrenous; (d) when a purulent arthritis is complicated by secondary hemorrhage from the popliteal vessels.

The important principle to follow is through disinfection and drainage. When no fracture is present arthrotomy is generally sufficient; when fractures are present resection is indicated. The wounds should never be sutured, but should remain wide open to prevent subsequent sepsis. When amputation is deemed necessary—because of extensive tissue destruction, etc.—amputate as low as possible in the thigh by the circular method and leave the stump wide open.

If there is no temperature when first seen it is wise to be conservative. Occasionally a missile lying outside of the joint and surrounded by infected tissue may give rise to the same picture as an arthritis; these should be carefully differentiated.

Bone Transplantation in the Surgical Treatment of Paralytic Feet. JOSEPH E. FULD. *Annals of Surgery,* February, 1918.

With the object of securing a bony ankylosis in a position of equilibrium, a bone graft is inserted which passes through both malleoli and the body of the astragalus.

Value of the Caliper in the Obtaining Extension in Compound Fracture of the Femur. F. A. BESLEY, Chicago. *Journal of the American Medical Association,* January 12, 1918.

In a preliminary report on the value of the caliper in obtaining extension in the compound fracture of the femur, Besley speaks of the inadequacy of most of the methods used in obtaining extension in cases of fractured femur. The multiplicity of methods used, he says, gives direct evidence of the fact that no one has been eminently successful. Experience has taught us that no foreign body should be applied to the fractured ends of bone in a recent compound fracture. He asks what shall be done with the compound fractures of the femur seen in war surgery. We have to deal, first, with a large open wound, and, secondly, with the reduction and retention of the fractured bone. If treatment can be immediately begun after the patient is wounded, the ideal method would be to clear out the wound of all foreign bodies and excise the contused, lacerated and devitalized tissues, so as to render the wound as sterile as possible. After this, the wound should be closed immediately, or within two days, with sutures inserted at the time of the operation, but left loose to be tied later. If we could obtain a primary union, as is often the case, we are still confronted with a simple fracture and our problem is to obtain extension sufficient to counteract the pull of the strong muscles of the thigh. More extension is required in the robust soldier than in the less developed civilian. The large number of cases of compound fracture seen by the writer came to him soon after the infliction of the wound. Nearly all had been dressed at the front and placed in a Thomas splint or something of the kind, and traction had been secured by adhesive plaster and Sinclair's glue. The traction is usually maintained by means of a rubber band attached to the bottom of the splint. At first, much difficulty was experienced in maintaining traction on the distal fragment. The Steinmann nail was used with good results in fractures of the upper third of the femur, but the writer and his associates hesitated to use it in the lower third. Some years ago, Ransohoff advocated the use of the caliper or ice tongs, applied to the condyles of the femur. This device the writer had used a few times in civil practice, and it had appealed to him strongly. The difficulty was in obtaining proper devices. Lieut. C. J. Glaspel devised a very satisfactory caliper out of meat skewers. The method of application of this crude device is described in detail, with illustrations. The writer advocates its use very strongly, calling it the best method of securing traction in all compound fractures of the femur met with in war practice. He regrets that up to the present time he could not employ the roentgen-ray to show his end-results, but these will be secured later and presented in a future article. Of course, no plan of treatment can be outlined and carried out completely unless it is accurately controlled by roentgen-ray observations. At the time of writing, he has about forty cases under treatment by the caliper method, and the patients obtain more comfort than would otherwise be possible by any other practicable means of traction.

A New Operation for the Substitution of a Thumb. J. L. JOYCE. *British Journal of Surgery,* January, 1918.

A thumb was lost as a result of a gunshot wound and in its place the ring finger of the opposite hand was substituted. The steps in the procedure were as follows:

1. Preparation of the bed for the reception of the new metacarpal bone, and exposure of the proximal ends of the divided tendons of the thumb.

2. Dislocation of the ring finger of the opposite hand at the metacarpo-phalangeal joint, involving division of the soft tissues at the base of the radial side of the proximal phalanx, division of the extensor and flexor tendons, and the preservation of a nutritive flap on the ulnar side of the finger.

3. Fixation of the new metacarpal bone (proximal phalanx of the ring finger) in its bed, union of tendons and nerves, suture of incisions and fixation of the two hands in apposition.

4. Division of nutritive flap—two months later than 1, 2 and 3.

An excellent result and a useful finger was obtained.

The Rationalè of Radiotherapy in Uterine Hemorrhage. J. A. CORSCADEN. *American Journal of Obstetrics,* February, 1918.

The *x*-ray destroys the Graafian follicle, which in turn controls menstruation, and hence menstruation can be controlled by the use of the *x-ray*. Similarly, abnormal uterine bleedings can be controlled, as the majority of them arise from disturbances in the menstrual mechanism, and not to local mechanical causes.

Radium also possesses a local cauterizing effect on the uterine cavity. In women of the late child-bearing period radiotherapy is the procedure of choice. In girls radiotherapy should be used as a late procedure. The induction of an artificial menopause for economic reasons is possible. Whether it is justifiable or not is a matter for discussion.

In fibromyomata associated with bleeding, the same result, amenorrhea, follows, as it does in uterine bleeding, from a grossly normal uterus. The fibromyomatous mass shrinks as a result of the radiotherapy to a marked degree, often to an extent that permits the mass to escape palpation. Unless the fibromyomata cause symptoms, they should remain untreated. Radiotherapy is the treatment par excellence, when hemorrhage is the only symptom, because it reduces the condition to the symptomless class. Since the amenorrhea should be permanent, radiotherapy is particularly indicated for women of thirty-eight years or over, while it should be restricted more and more as the age is lower. Where mechanical symptoms predominate they are best treated mechanically, *i. e.,* by operations.

The uterine bleeding as treated in eight girls was controlled with varying success in all cases. In three the menses became almost normal; in five an amenorrhea of varying duration was induced. In one instance there were severe hot flushes for a period covering nine months.

Radium appears to exert the same influence as *x*-ray therapy. The advantage of radium over the *x*-ray is that one treatment carried over twenty-four hours usually suffices for results. With the *x*-ray, the treatment is spread over six to ten weeks. Uterine hemorrhage from any cause may be stopped by the intrauterine application of radium. Hemorrhage from disturbed menstruation with or without fibromyoma may be controlled by the *x*-ray. Practically all fibromyomata will shrink to a satisfactory degree after radiotherapy, while no harm results.

All cases of hemorrhage from a grossly normal uterus in women of thirty-eight or over should be treated by radiotherapy after carcinoma has been ruled out by a diagnostic curettage. In younger women radiotherapy should be used only as a late resort. For uterine hemorrhage associated with fibromyomata of the uterus, radiotherapy is indicated, if symptoms from mechanical causes are absent and the woman is over thirty-seven years of age.

Pregnancy in Cases of Tuberculosis of the Lungs. JOSEPH WALSH. *American Journal of Obstetrics,* February, 1918.

Walsh argues that pregnancy does not exert the harmful influence upon tuberculous women that is alleged. Thirty-eight patients who were observed within a period of fifteen years gave birth to a total of fifty children. Only five mothers died. His experience is at least as favorable with respect to mortality statistics as that of authors who practice abortion, sterilization, etc., for pregnant tuberculous women. Many children were saved who otherwise would have been sacrificed before viability.

His conclusions are as follows: Active cases of tuberculosis should be advised against marriage; quiescent cases especially after treatment and education bear the duties of marriage sufficiently successfully to warrant the risk of marriage. Patients with quiescent conditions, if pregnant, are to be placed upon a rigid regimen and may be expected to come through the pregnancy with but little, if any, advance of the tuberculosis. Women with active tuberculosis, if they become pregnant, run a definite risk, but the operations for abortion, especially those associated with sterilization, have a mortality making the continuation of the pregnancy more desirable and safer.

Version, with a Report of 200 Additional Cases Since September, 1916. IRVING W. POTTER. *American Journal of Obstetrics,* February, 1918.

It is interesting, though rather astounding, to read what can be done with an obstetric procedure which is usually regarded as having very definite limitations. Potter reports two hundred versions performed within a period of one year, as an addition to the five hundred he previously reported. There was no material mortality. Eighty-five were performed in primipara and one hundred and fifteen in multipara. His chief indication appears to have been occipito posterior presentations (126 instances—40 right occipito posterior). Five times in R. O. A. and three times in L. O. A. He performed version in preference to using forceps. A large variety of conditions make up the remainder of the indications for version. Sixteen children delivered were still-born, not as the result of the version, but because of intrinsic causes lying in either an abnormality of fœtus itself, of the placenta or in prolapsed cord.

Potter maintains that version lessens the shock of labor, decreases the dangers due to pressure from and upon the head of the child, and is superior to prolonged labor and instrumental delivery.

[While no one will doubt Potter's report and everyone will admire his results and daring, the same will still remain a feat performed by an expert who has specialized in this well-established and well-tried obstetric manœuvre. There will be little imitation by other obstetric specialists, much less by practitioners in obstetrics. It is well to bear in mind the brilliant success of version when properly executed as an alternative in certain obstetric emergencies where judgment would ordinarily lean toward more conservative measures. As a procedure of choice, to be employed in routine practice, it will scarcely attract a following in the profession.]

Premature Separation of the Normally Implanted Placenta. ARTHUR H. MORSE. *Surgery, Gynecology and Obstetrics,* February, 1918.

Two cases of premature separation of the placenta are reported by Morse, in one of which he examined the extirpated uterus and in the other a complete autopsy examination was made. In both instances the fœtus was dead.

The striking feature was the cyanotic appearance of the uterus, which was tense, firm, and had lost its contractility. In the case which recovered there was concealed hemorrhage, while in that coming to exitus, hemorrhage was both frank and concealed. The chief pathological findings were vascular extravasation intramuscularly with the mural veins distended, with or without thrombosis being evident.

Morse reproduced the lesions and the same clinical result by ligating the total efferent veins of one horn of the uterus in a pregnant rabbit, the other pregnant horn remaining untouched as a control. In each experiment there resulted rapid cyanosis of the ligated horn and partial or complete separation of the placenta, with death of the fœtus. The musculative on section showed the same alterations observed in the human subject.

While the cause of thrombosis of the uterine veins is not definitely known, Morse suggests that constrictions of the vessels may follow a certain degree of torsion of the uterus observed in multipara with poor abdominal support arising from lax abdominal walls. Firm support is needed by this type of women to prevent the possibility of displacement with the resulting pressure on the veins.

Report of Nineteen Cases of Hyperplasia of Thymus Gland Treated by the X-Rays. JULIEN E. BENJAMIN and SIDNEY LANGE. *Archives of Pediatrics,* February, 1918.

This study comprised one year's observation of all kinds of cases in a children's department. Of 125 cases seen during this time, nineteen showed evidence of an enlarged thymus. The clinical diagnosis of an enlarged thymus was confirmed by *x*-ray examinations. *X*-ray therapy was then carried out in each case. The child was kept quiet by sand bags placed upon each extremity. At intervals of one week, treatment was given. This consisted of a routine exposure of 25 milliampere-minutes at the target

skin distance of approximately nine inches. The treatments are harmless. Clinical improvement may be noticed from 24 to 48 hours after treatment.

Some Observations on the Surgery of the Thyroid Gland. W. D. GATCH. *The Journal of the Indiana State Medical Association,* January, 1918.

Gatch likes to employ a skin injection of adrenalin solution as a clinical measure of estimating the degree of hyperthyroidism. The extent and duration of local reaction would appear to be in direct proportion to the amount of thyroid secretion. Gatch also determines whether or not is safe to operate on his thyroidic patients by estimating the functional capacity of the heart, and in some doubtful cases he makes an electrocardiographic examination. Although the heart in hyperthyroidism is not diseased organically, but only over-stimulated, still this over-stimulation may produce heart insufficiency. Where such insufficiency exists, it is imperative to see clearly operative indications and contraindications. The patient is given a long rest before operation. He receives an expert anesthesia. The operation is systematically performed with strict attention to hemostasis. A portion of the gland is removed. Gatch points out that mania in a hyperthyroid patient means imminent fatality.

The Surgical Treatment of Pernicious Anemia. CHARLES K. P. HENRY. *The Canadian Medical Association Journal,* February, 1918.

Treatment for this condition must accomplish three things: (1) remove the source of infection; (2) make up for the lost blood by transfusion of whole blood, and by stimulation of the blood-forming organs; and (3) stop hemolysis.

The author advocates surgical treatment by transfusion and splenectomy. Cases that receive this treatment from the very earliest do best. Transfusions are first done, the spleen is removed, and subsequent transfusions are employed from time to time. It is important to search for any possible foci of infection in order to remove them. At the time of splenectomy, it may be necessary to remove also the appendix and gall bladder, as these organs may be the site of infection.

Henry states that the duration of the disease is shorter under medical treatment than under surgical treatment by transfusion and splenectomy.

A New Incision for Exposure of the Lower Abdomen and Pelvis. JOHN W. CHURCHMAN. *Annals of Surgery,* February, 1918.

The incision has two limbs: one running vertically in the median line towards the pubis, and the other at right angles to, and from the upper end of, the first limb. The rectus muscle is divided transversely, the external oblique muscle is separated in the direction of the fibres, and the internal oblique and transversalis are divided in the line of the skin incision. In suturing, the fascial layers are overlapped. A second transverse limb can be added on the other side, giving a T-shaped incision.

Intestinal Obstruction: An Experimental Study. BARNEY BROOKS, HARRY W. SCHUMACHER and JOHN E. WATTENBERG. *Annals of Surgery,* February, 1918.

A series of experiments is described in which it is shown that the toxic bodies which cause death in intestinal obstruction are produced in the obstructed loops. The intestinal obstructions are produced in the obstructed loops. The intensity of the poisonous effects depend on the ease with which the toxic fluid is absorbed, and it is shown that absorption takes place only through damaged mucosæ. No absorption takes place through healthy bowel wall.

The Etiological Relationship of Benign Ulcer to Carcinoma of the Stomach. ABRAHAM O. WILENSKY and WILLIAM THALHEIMER. *Annals of Surgery,* February, 1918.

The only criteria for judging this relationship, which are at present available, are of a pathological nature and the microscopical picture is often such as to make it difficult, if not impossible, to determine with accuracy which of the two lesions is primary and which is secondary. It is probably that lesions, in the largest percentage of the cases, begin and end as one or the other of these two conditions. In only a very small percentage—1 or 2 per cent—was it at all possible to say that carcinoma had been engrafted on a benign lesion. Even in these the evidence was not conclusive.

Roentgenological Studies in the Healing of Gastric and Duodenal Ulcers. W. W. HAMBURGER, Chicago. *American Journal of Medical Sciences,* February, 1918.

Starting with the repeatedly confirmed observation of Haudek, that ulcers of the lesser curvature can be diagnosed in the *x*-ray plate by the presence of a small rounded projection in the shadow, Hamburger made a number of observations to determine whether this shadow disappeared after either surgical or medical treatment. He found that in some cases the plates showed a progressive disappearance of this pocket and this disappearance was associated with accompanying clinical improvement and cure. Such evidence is strong presumptive evidence of healing of the ulcer. In certain other cases the niche remains or even grows larger. In such cases the question arises as to whether they are being correctly treated, or whether the ulcer is of specific or cancerous origin. Perhaps, in such cases, the patient must be treated surgically. On the other hand, complete disappearance of the niche cannot be interpretated as complete, normal restitutions. The failure of normal peristaltic waves to continue through the ulcer area is positive evidence of a remaining pathological condition. Hamburger's studies indicate an interesting and important field for study, and may perhaps serve to differentiate the cases appropriate for either medical or surgical treatment.

Congenital Atresia of Small Intestine. FRANK VANDER BOGERT. *Archives of Pediatrics,* January, 1918.

The author adds a fourth case to three previously described. A full-term baby was born, apparently normal in appearance. Abdominal distention appeared within the first day, and in the second night, intestinal peristalsis was observed. The baby vomited soon after birth. Oil given by mouth was returned within five minutes. On the third day, the vomitus became fecal. The bowels did not move. Repeated enemae resulted in the discharge of a large mucous cast of the bowel, filled at its upper portion with a substance resembling mecomium, except that there was no bile reaction. The baby died at the end of its fourth day.

Autopsy showed a complete obstruction, the small gut ended abruptly twenty-five inches above the ileo-cecal valve.

The author emphasizes the value of the absence of bile in the stool in this condition. He believes this is evidence of a complete obstruction and that immediate operation should be carried out.

Inflammatory Rectosigmoidal Strictures, Hitherto Undescribed. GRANVILLE S. HANES. *Interstate Medical Journal,* January, 1918.

Hanes describes a type of stricture with the following characteristics:

(1) It always involves the rectosigmoidal juncture, extending above or below this point.

(2) There are wart-like excrescences that protrude from the surfaces of the strictures; these are very soft, friable and detachable. When destroyed, however completely, they return.

(3) They bleed upon the slightest manipulation. The mucosa is very granular.

(4) There is a characteristic grayish-white exudate all along the stricture surface.

(5) The patients have distressing diarrhea and tenesmus.

(6) The strictured portion may involve four or five inches of the intestine.

(7) There is a thickening of the layers of the intestinal wall.

Hanes feels that this condition is produced by some specific bacterium. The author has performed colostomies in three of the eight cases which came to him with this condition.